Housing Element
Safety Element
and Noise Element
TECHNICAL APPENDICES

City of San Buenaventura

Housing Element
TECHNICAL APPENDIX

City of San Buenaventura

COMPREHENSIVE PLAN UPDATE TO THE YEAR 2010

HOUSING ELEMENT

TECHNICAL APPENDIX

CITY OF SAN BUENAVENTURA

Adopted By The City Council

August 28, 1989

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HOUSING ELEMENT TECHNICAL APPENDIX

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Exhibit 2 State Department of Housing and Community Development Comments on City of San Buenaventura Draft Housing Element

Exhibit 3 City of San Buenaventura Affordable Housing Program

I. SUMMARY

This Housing Element Technical Appendix is part of the City's Comprehensive Plan. It complements the goals, general objectives, and policies contained in the Housing Element of the Plan. Together, the Housing Element and Technical Appendix address state housing goals and local housing needs.

The Technical Appendix contains the following sections:

- Existing Conditions: General housing characteristics and housing needs by category, including new construction, rehabilitation and replacement, and special needs.

- Future Housing Needs: Future housing needs as set forth by the Regional Housing Needs Assessment for Southern California, along with population and employment projections and information on the balance between jobs and housing.

- Inventory of Land: Vacant, residentially designated lands available and suitable for housing development and redevelopment, and the ability of these lands to satisfy housing needs.

- Governmental and Non-governmental Constraints: A description of land use controls, building codes, development fees, resource constraints, cost of land, and other factors which impede meeting housing objectives.

- Energy Conservation: Methods to encourage energy conservation.

- Progress Review: Summary and analysis of progress made under the previous Housing Element.

- Housing Programs: Description of a schedule of programs designed to address housing needs over the next five years, with quantified

objectives, where appropriate, and implementation responsibilities, including who will carry out the programs, funding and scheduling. A summary table sets forth quantified targets for housing construction, rehabilitation and conservation.

-Other Housing Program Components: Explanation of how other requirements for the Housing Element are met, including equal housing opportunity, citizen participation, Comprehensive Plan consistency, and housing in the coastal area.

State Housing Element Guidelines are contained in Exhibit 1 as a reference at the end of this document. The State Department of Housing and Community Development's comments on the Draft Housing Element are included in Exhibit 2.

Provision of adequate and affordable housing has become a critical issue in the City, as it has throughout coastal Southern California. The City has undertaken a variety of programs to meet increasingly challenging housing needs, including innovative incentives for 100% affordable housing projects, that have placed it among the leaders in Ventura County. (The City Affordable Housing Program is presented in Exhibit 3.)

Exhibits 1, 2 and 3 are presented only for informational purposes, and are not adopted as part of the Housing Element Technical Appendix incorporated in the Comprehensive Plan by reference.

At the same time, the City has lost ground in meeting housing needs, especially in terms of affordability. This is largely as a result of regional economic and population growth beyond Ventura's ability to control, and unprecedented increases in the price of land and housing.

The Southern California Association of Governments (SCAG) Region's (Ventura, Los Angeles, San Bernardino, Riverside, Orange and Imperial Counties) population has grown to over 13 million people, and has been projected to grow by another five million persons by the year 2010.

Coastal Southern California has some of the highest housing costs in the country. As one of the most desirable locations to live within the region, Ventura has experienced unprecedented upward pressure on housing costs. In 1988, the median resale price of a single family home rose to over $200,000. These trends have placed home ownership beyond the reach of most first-time buyers, and seriously constrained meeting the needs of lower income groups in particular. Given these powerful regional trends, the City's primary challenge is to moderate the deterioration of local housing affordability. Realistically, fully satisfying all local housing needs is not possible in the foreseeable future.

Chart 1 summarizes important housing affordability data in a tabular format.

As noted in Chart 1 and described in the Technical Appendix, the City cannot meet State mandated Regional Housing Needs Assessment (RHNA) objectives as set forth by SCAG for housing over the next five years (1989-1994). Constraints imposed primarily by air quality, water supply, and the price of land require that the City establish objectives which differ from identified housing needs, as provided for under Section 65583(b) of the Government Code. The City's revised objectives are shown in Chart 1, under "City Estimate," for new construction.

Chart 2 identifies the estimated maximum number of housing units that can be constructed, rehabilitated, and conserved over the five-year time frame (1989-1994) in the City of San Buenaventura.

CHART 1

CITY OF SAN BUENAVENTURA

HOUSING BY INCOME CATEGORY

Income Category	% of Median Income	Income Level	Monthly Housing Expense	Last 5 Years (DU)	City Estimate Next 5 Years (DU)	RHNA Next 5 Years (DU)
Very Low	< 50%	< $21,590	< $539	48	157	698
Low	50%-80%	$21,590-$34,553	$539-$863	358	160	1,044
Moderate	81%-120%	$34,554-$51,800	$864-$1,295	600	782	892
High	> 120%	> $51,800	> $1,295	1,976	1,014	1,482
TOTAL				2,982	2,113	4,116

Income levels and expenses as of March 1989, based upon 3-bedroom/4-person households.

Assumes 50% of new construction single family, 20% condominiums, and 30% apartments.

Assumes 40% of apartments low or very low income and 60% moderate income.

Assumes 275 100% affordable ownership units in next five years (1989-1994) are moderate income.

Assumes Air Quality Management Program (AQMP) population of 504 in 1989 and 1,100 per year 1990-1994.

CHART 2

QUANTIFIED FIVE-YEAR HOUSING OBJECTIVES (1989-1994)

	CONSTRUCTED (DU)	REHABILITATED (DU)	CONSERVED (DU)
VERY LOW	157	15	
LOW	160	45	1,835*
MODERATE	782	15	
HIGH	1,014	-	-
	2,113	75	1,835

*The 1,835 units to be conserved are distributed among very low, low and moderate categories, and are basically units in the City's mobile home parks which are required to be maintained.

In addition, 285 beds for the homeless should be conserved, and 50 new beds provided. (Of these, 180 beds are at the Zoe Christian Center in Oxnard.)

II. EXISTING CONDITIONS

A. GENERAL HOUSING CHARACTERISTICS

In order to assess housing needs in the City, it is necessary to know what the existing housing characteristics are. This section summarizes those characteristics.

Because no single comprehensive data source exists, the information is compiled from a variety of sources, including the 1980 Census, the California Department of Finance, the Southern California Association of Governments, and local statistics. Data from the Regional Housing Needs Assessment (RHNA) for Southern California have been used where available. Where older numbers were used, they have usually been projected forward on a pro rata basis. For example, the percentages derived from 1980 Census figures have been applied to current population totals in some cases. Thus, most numbers are stated for 1989.

CHART 3 - HOUSING CHARACTERISTICS

Total Estimated Population (1/1/89)			90,826	
Group Quarters		962		
Population in Households		89,864		
Housing Units			36,829	
Vacancy Rate			2.95%	
Occupied Units			35,742	
Rental Occupied Units			16,084	(45%)
Owner Occupied Units			19,658	(55%)
Single Family Dwellings		22,500 (61.1%)		
SF Detached	20,246 (55%)			
SF Attached	2,254 (6.1%)			
2-4 Units		4,028 (10.9%)		
5+ Units		8,052 (21.9%)		
Mobile Homes		2,249 (6.1%)		

Source: Department of Finance
City of San Buenaventura Housing Assistance Plan (FY 1988-1991)
(Rental/owner occupied figures projected forward from previous estimate.)

B. EXISTING HOUSING NEEDS

The City's housing needs have many components. In order to adequately assess these needs, it is necessary to examine the components individually. They include the following categories: (1) households that are homeless; (2) those that are overpaying for their housing; (3) those that are overcrowded; (4) and occupied units that are in substandard condition. Furthermore, it is necessary to review special housing needs such as housing for handicapped, elderly, single-parent, large, and farmworker households.

1. Homeless

One aspect of housing need that is growing rapidly, and has received increased City attention recently, is the problem of the homeless. The homeless population is growing in size and is also changing from the traditional image of the indigent, single male. The "New Homeless" have been created by the combination of high housing costs, changes in governmental support policies, and other factors. Lower income households live on a very narrow margin, and any unexpected expense, or more significantly, the loss of a job, can cause these households to lose their housing. Federal support programs have been drastically cut. Once out of the housing market, it becomes increasingly more difficult for these households to reacquire permanent shelter, as the higher costs of living in temporary quarters or "on the street" prevent households from saving enough money for first and last months' rent and security deposit, much less a down payment for a house. These problems have created a new population of homeless that includes families with children, especially single-parent families; young runaways; and battered women.

In addition, Federal and State policies designed to shift the care of mentally ill persons to local jurisdictions have had limited success. The result has often been to force these people, most of whom are not competent to care for themselves, out onto the streets, where their condition rapidly deteriorates.

By their very nature it is difficult to count the homeless, much less assign even an approximate number of them to any particular city. In 1985, the Ventura County Homeless Coalition conducted a survey of the homeless in western Ventura County. This survey found 468 homeless persons. Of these, 184, or 39%, were children. Approximately 68% had been residents of Ventura County for longer than six months, and 38% had been residents for longer than five years.

The City's Housing Assistance Plan (FY 1988-1991) estimates that from 200-450 homeless persons are in Ventura, and in need of emergency or transitional shelter.

2. Overpayment

A key determinant of housing need is the number of households paying too much for their housing. Households are considered to be paying too much for housing when they are spending over 25% to 30% of their gross monthly income for housing. Based on the standard of 30% or more of gross monthly income for housing costs, the Regional Housing Needs Assessment (RHNA) for Southern California prepared by the Southern California Association of Governments (SCAG) identifies 6,522 lower income households in Ventura as overpaying for housing. Of these, 1,136 are owner-occupied households, and 5,387 are renter-occupied. (There is a mathematical discrepancy of one household when owner and renter-occupied households are totaled; this is probably attributable to rounding in the RHNA computer model.)

3. Overcrowding

The HUD definition of overcrowding is set at 1.01 or more persons per room. The statistics below on overcrowding are based upon 1980 Census data projected forward.

CHART 4 - OVERCROWDED HOUSEHOLDS

People Per Room	Owner Units	Rental Units	Total
1.01-1.50	262	539	801
1.51 or more	146	472	618
Total	408	1,011	1,419

Source: 1980 Census (projected forward)

The above figures reveal that 1,419, or approximately 4% of the households in Ventura, are considered overcrowded.

4. Substandard Housing

Many households are housed in substandard units. Substandard housing is defined as housing which does not meet U.S. Department of Housing and Urban Development (HUD) Section 8 existing housing standards. Chart 6 is based on 1980 Census figures for substandard housing, updated to 1989. The figures indicate that 1,452 of Ventura's occupied housing units, or approximately 4%, are substandard.

CHART 5 - SUBSTANDARD HOUSING

	Occupied Units	Percent Substandard	Number of Substandard Units
Owner	19,658	2.1%	408
Renter	16,084	6.5%	1,044
Total	35,742	4.1%	1,452

Source: 1980 Census (projected forward); City HAP

The Census statistics also list other housing conditions. The data projected forward from 1980 indicate that of the occupied housing units, 739 had no kitchen facilities, 827 had no bathroom or only half a bath, and 475 lacked complete plumbing for their exclusive use. These units are included in the substandard housing figures.

The City's Housing Assistance Plan (HAP) for FY 1988-1991 provides additional information on substandard units, as portrayed in the following chart:

CHART 6 - SUBSTANDARD UNITS

Tenure	SUBSTANDARD UNITS			SUITABLE FOR REHABILITATION			
	Occupied	Vacant	Total	Occupied		Vacant	Total
				Not Lower Income	Lower Income		
Owner	426	8	434	239	145	7	391
Renter	1,026	41	1,067	362	561	37	960
TOTAL	1,452	49	1,501	601	706	44	1,351

Source: City of San Buenaventura HAP (FY 1988-1991)

This information suggests 150 units (1,501 substandard units - 1,351 units suitable for rehabilitation) require replacement.

5. Special Housing Needs

a) Handicapped: The State Department of Rehabilitation estimates that 11% of the population under 65 has some form of physical disability. The City includes an

estimated population of 80,018 individuals under 65, which yields an estimate of 8,802 persons in that age group with some form of physical disability. The estimated population 65 and over is 10,808, or 11.9% of the City total. The 1980 Census indicated that 14% of the City's population 65 years and older had a mobility disability, which projected forward would equal 1,513 persons. Thus, the total estimated population in Ventura with some form of physical disability is 10,315 persons.

The housing needs of the disabled person vary with the type and severity of the handicap. Not all individuals require specialized housing considerations. However, a large percentage of those who are able to live independently require a street level unit with kitchen and bathroom modifications. Accessibility to public transportation is also desirable. In addition to these needs is often the need of affordable housing. No statistics are available on the total number of units equipped for handicapped persons.

b) Elderly: As noted under the preceding discussion of handicapped needs, the 1980 Census and City HAP indicate that approximately 11.9% of the City's population is 65 years and older. With an estimated 1989 population of 90,826, this calculates to 10,808 people. Many of these elderly residents are severely affected by the rapid rise in the cost of housing.

The 1980 Census also indicates that 7.3% of those people 65 years and older, or 789 residents (projecting Census data forward), have incomes below the poverty level. The City Housing Assistance Plan for FY 1988-1991 indicates that of the households requiring housing assistance, 31.9% are comprised of elderly

persons. The City HAP identifies 1,565 households made up of the elderly in need of rental assistance.

Low income elderly renters are not the only senior residents who are experiencing problems as a result of the inflationary housing market. Many elderly homeowners living on limited retirement income have a very large equity in their home; however, they have difficulty meeting the day-to-day cost of living. As an alternative, they can sell their homes and use the capital gain for living expenses. This alternative requires affordable replacement housing such as a lower cost condominium, a less expensive single family home, an apartment or a mobile home. The high cost of any dwelling (single family detached or condominium), high interest rates, the limited number of mobile home park spaces, and the lack of affordable, accessible rentals may make it difficult for elderly persons to maintain a home and meet their living expenses.

c) Single Individuals with Dependent Children: Single-parent households are also subject to special housing problems. Such households frequently are in a lower income range, particularly when the single parent is female, as is usually the case. Households with children typically have more difficulty finding adequate, affordable housing, and this is aggravated when it is a single-parent household with a lower income.

The 1980 Census indicates that 16.1% of City families are headed by single parents with children in the home. An estimated 2.6% of these are male and 13.5% female. Applying these percentages to a 1986 estimate of 24,091 families, the following is calculated:

Male Householder, No Spouse, with Children -	626
Female Householder, No Spouse, with Children -	3,252
	3,878

Currently there is over a one-year waiting period for single-parent families seeking housing through the Housing Authority. They estimate that over 30% of all assisted units are occupied by single-parent families. Other needs single-parent families have besides affordable housing are available day care, schools near their place of residence and latch-key programs.

d) <u>Large Families</u>: The U.S. Department of Housing and Urban Development (HUD) definition of a large family is one that has five or more members. The 1980 Census indicates that 9.9% of the City's households have five or more members and 27.1% of these are family units. Applying these percentages to the 1989 population, it can be estimated that 3,538 households and 959 families consist of five or more members. Projections from 1980 Census figures estimate that there are only 964 houses with five or more bedrooms; hence, a need exists for housing to accommodate large households. Although not a major sector of the City's housing needs, the low income, large household presents a special problem due to the large disparity between housing costs and household incomes.

Large households with children have an even more difficult time finding housing. Rental complexes may be restricted to adults only. Therefore, there is even a more critical need to provide housing, particularly rental units, for families with children.

e) <u>Farm Workers</u>: Agricultural employment in California generally consists of low paid, hired workers. The Private Industry Council of Ventura County estimates

that there were 14,000 people employed as farm, fishing and forestry workers in Ventura County during the first quarter of 1986. SCAG estimates that 43.7% of these, or 6,118, are farm workers. SCAG also estimates that those employed as farm workers in the City of Ventura are 4.83% of the County figure, and 90% of these have low or very low income levels. Applying these percentages to the County statistics yields 296 farm worker households in Ventura, and 266 with low or very low incomes.

The housing problems farm workers face are largely due to low annual incomes. In 1980, a survey on year-round farm worker families in Ventura County indicated that they had an average annual income of $8,000, while migrant families earned an annual average of $5,000. Housing for this income bracket is usually provided through State or Federal subsidy programs. The Cabrillo Economic Development Corporation has also been active in meeting farmworker housing needs, including projects in the City's Planning Area.

6. First-Time Home Buyers

A further aspect of housing need that is difficult to quantify is the need for affordable housing for the first-time home buyer. Young, moderate income households are caught in a bind between increasing rents which make it difficult to accumulate savings for a down payment on a home, and the high and rising costs of purchasing a home. A moderate income household is defined as one making between 80% and 120% of the median income for families in the County. The standard for housing expense is 30% of gross monthly income for all housing expenses. Chart 7 translates these standards into affordable monthly housing expense, using HUD's median income for a family of four.

CHART 7 - INCOME AND HOUSING EXPENSE

Income Category	Income Range	Monthly Housing Expense
Low	Less than $32,880	$822 or less
Moderate	$32,881-$49,320	$823-$1,233
High	Over $49,321	$1,234 or more

To further illustrate what this means to a family trying to buy housing: if a moderate income household were trying to purchase a home, and were able to obtain mortgage financing at a 10% fixed rate for 30 years, an $823 monthly payment would support a loan of approximately $90,000. If the family were able to accumulate $22,500 for the necessary 20% down payment, they could then afford a $112,500 unit. At the higher end of the moderate income range, a family able to spend $1,233 monthly could support a loan of approximately $130,000, so that with an adequate down payment, they could afford a $162,500 unit. There are very few single family homes available for sale in these price ranges. While condominiums are generally available at lower prices than detached units, the condominium association fee, usually in excess of $100 per month, increases the monthly expense. In order to maintain the same monthly housing expense, the sale price of the condominium would have to be at least $10,000 less.

These figures demonstrate that it is very difficult for the moderate income household to purchase their first home. Low income households, and moderate-income households in the lower portion of that range, are effectively excluded from the home-buying market and must rely on rental units to provide housing.

III. FUTURE HOUSING NEEDS

A. RHNA FUTURE HOUSING NEEDS

The Regional Housing Needs Assessment (RHNA) for Southern California produced by the Southern California Association of Governments (SCAG) in June, 1988 sets forth existing and projected housing needs for each locality in the six-county SCAG region. Under State law, local housing elements must address the locality's "fair share" of the regional housing need, by income group, as set forth by the RHNA. The future housing needs for Ventura from the RHNA are presented in Chart 8.

CHART 8 - FUTURE HOUSING NEEDS THROUGH JULY 1, 1994

Income Category	No. of Units	% of Total
Very Low	698	17%
Low	1,044	25%
Moderate	892	22%
High	1,482	36%
Total	4,116	100%

Source: Regional Housing Needs Assessment for Southern California, SCAG 1988

Of the total of 4,116 new dwelling units called for under the RHNA, 3,507 would be to account for growth in the number of households. Of the remaining 609 cited by the RHNA, 566 would represent a "vacancy adjustment," and 43 a "demolition adjustment." The vacancy adjustment is an attempt to increase the number of units and create a more desirable vacancy factor in the overall housing inventory. A local concern is that given regional market conditions, at least presently, the excess units might merely attract more in-migrant residents to the community, rather than meeting existing local or regional needs. The demolition factor is to replace the number of units projected to be demolished.

The total number of lower income units (both very low and low income) cited for Ventura, 1,742, as well as the percentage of overall need, 42%, is the highest of any city in Ventura County. Since Ventura has, and is projected to have, only the fourth highest population of cities in the County, and currently has neither the highest nor the lowest income levels or inventories of lower income housing, the RHNA targets will be especially difficult for the City to achieve.

B. POPULATION AND EMPLOYMENT PROJECTIONS AND JOBS/HOUSING BALANCE

While State law requires that the City's analysis of housing needs include its share of regional housing needs as presented in the RHNA (i.e., it is assigned, and not derived by the locality's analysis), it is also useful to review local projections for population, employment and housing production. This is especially relevant in light of growing importance in the region and throughout the State of striving to achieve a better balance between the creation of jobs, and new housing to support these workers.

The Comprehensive Plan provides for a maximum population of 115,000 by the Year 2010. This would represent population growth of approximately 1,000 annually, which is at the low end of the range experienced during recent years in Ventura. The City Council also adopted a maximum population figure of 105,000 by the Year 2000, subject to the availability of additional water supplies needed to serve this population. If additonal water supplies sufficient to support this level of population are not secured, the maximum population is 102,000, which is what currently available local sources are estimated to be able to support.

The Final Environmental Impact Report (EIR) prepared for the Comprehensive Plan update in 1989 also considered a range of

population growth and development alternatives for the City's Planning Area. These alternatives included:

-94,000 population (build-out through 1990 based upon existing and pending projects);

-102,000 population (based upon the estimated maximum population which could be served with existing local water supplies);

-122,000 population (the Comprehensive Plan Review Committee recommended alternative); and

-147,000 population (based upon the estimated population which could be served with a full allocation of water from the State Water Project).

Based upon this analysis, the EIR projected the following employment growth and associated number of households expected to be generated by the growth in employment (assuming .89 new households per new job). Also presented is the number of new dwelling units (net) estimated to be provided under the City's Air Quality Management Program for each population alternative.

CHART 9 - ESTIMATED EMPLOYMENT AND HOUSEHOLD GROWTH

	ALTERNATIVE				
	1	2	3	4	ADOPTED
New Employment	3,180	10,743	16,947	30,562	17,099
New Households	2,030	9,561	15,083	27,200	15,218
New Dwelling Units	800	3,851	13,807	24,390	10,926

Source: City of San Buenaventura Comprehensive Plan Update to the Year 2010 Final Master EIR, McClelland Consultants, 1989; City staff for "Adopted." (Note: These totals were derived using 1987 as the base year.)

Under this analysis, the alternative adopted by the City Council would result in a jobs/housing ratio of 1.42 (64,773 jobs ÷ 45,500 dwelling units) in 2010, which is slightly above the 1.38 ratio identified in the EIR for the base case. The Southern California Association of Governments (SCAG) has recommended 1.2 as an ideal ratio.

According to the EIR, establishment of a four-year university in the Planning Area, as provided for under Alternatives 3 and 4 and the adopted plan, would generate additional indirect employment, which could worsen the balance between projected employment growth and new housing.

The Comprehensive Plan supports balancing new employment and housing opportunities, and the Housing Element contains a goal of striving to maintain a jobs/housing balance in keeping with accepted regional standards. The Land Use Element also contains a policy calling for the City to investigate a targeting and allocation process, similar to the residential allocation process, for commercial and industrial development. The Technical Appendix for the Economic Development Element in the Comprehensive Plan indicates that, based on the best available data, 51.8% of Venturans work within the City. This is highest percentage of any city in the County for residents who work within the city where they reside.

At the same time, the dramatic rise in housing costs experienced throughout the area makes it increasingly difficult for new employees to find affordable housing in communities where they work. This is also true in Ventura, where some of the projected employment growth is anticipated to occur in lower paying service sectors of the economy.

Also important is the recognition that commercial and industrial development is critical in providing employment for residents, and in generating revenues which allow the City to provide

necessary public facilities and services. Without such revenues, the City would be hard pressed to support new residential development, or to carry out its existing and proposed housing programs.

IV. INVENTORY OF LAND

Chart 10 lists all currently approved and pending residential projects as of January 1, 1989. The chart provides the project or developer name, the location by Planning Community, the land use designation (and applicable zoning where the land use designation is Existing Urban), the type of dwelling units proposed, the site acreage, the number of dwelling units, the status of the project, and whether or not a population allocation has been received under the City's Air Quality Management Program (AQMP). (The Land Use Element of the Comprehensive Plan defines various land use designations, lists allowable densities for each designation, contains a matrix which matches allowable zoning category designations with appropriate land use designations, and contains a table which shows potential building intensity and maximum population densities for residentially designated land areas throughout the City.)

Chart 10 provides a project specific inventory of lands with appropriate residential land use classifications. The Land Use Element and Land Use Plan Map identify lands suitable for residential development, including all lands designated for residential development (PR, HPR, etc.), some Commercial (C) and Planned Mixed Use Development (PMXD) land use designations, and all R zones, Mobile Home Park zones, and C-1, C-1A and C-2 zones in the Existing Urban designations. Chart 10, together with the Land Use Element Community Intent and Rationale Statements and the Land Use Plan Map, reflect that a more than adequate supply of land is available to meet the regional fair share numbers from the Regional Housing Needs Assessment.

CHART 10 - APPROVED* AND PENDING PROJECTS (1/1/89)

PROJECT	LOCATION COMMUNITY	LAND USE DESIGNATION	TYPE OF DU	ACREAGE	DU	STATUS	AQMP
CABRILLO HOMES	North Avenue	SF	SF	5	28	Approved	Yes
COMMUNTIY HOMES	North Avenue	SF	SF	4	24	Approved	Yes
PRI-KOM DEVELOPMENT	North Avenue	AG***	SF	27	180	Pending	No
WEST HILLS (KOMOROWSKI)	Avenue	PR-8 & HPR-8	SF	10	46	Approved	Yes
SENECA GARDENS (BULMER)	Avenue	HPR-8	Apt.	85	60 57	Approved Pending	Yes No
NORTH FORK SPRINGS	Avenue	C	Apt.	.7	20	Approved	Yes
FISHER	Avenue	TR-15 & C	Apt.	1	16	Approved	Yes
VOIGHT	Avenue	TR-20	Condo.	.5	7	Pending	Yes
WYMAN	Avenue	TR-20	Apt.	.3	5	Pending	Yes
MARMONT	Avenue	Existing Urban (R-3-5)	Apt.	.4	8	Approved	Yes
HEMMER	Downtown	HPR-20	Condo.	.9	4	Approved	Yes

CHART 10 - APPROVED* AND PENDING PROJECTS (1/1/89)

PROJECT	LOCATION COMMUNITY	LAND USE DESIGNATION	TYPE OF DU	ACREAGE	DU	STATUS	AQMP
HUBBARD	Downtown	PMXD	Condo.	3	88	Pending	No
O'LEARY	Downtown	Existing Urban (RPD-18H)	Condo.	.3	7	Pending	Yes
BERGSEID	Downtown	MF-28	Apt.	.2	8	Approved	Yes
McLEOD	Catalina	HPR-6	SF	12	17	Approved	Yes
TOPA TOPA RANCH	Catalina	Existing Urban (C-1)	Apt.	.4	20	Approved	Yes
KOMOROWSKI	Catalina	Existing Urban (C-1)	Apt.	.8	20	Pending	Yes
McINTYRE	Catalina	Existing Urban (C-1)	Condo.	.5	20	Pending	Yes
WESTLAND	Camino Real	Existing Urban (RPD-20)	Apt.	.5	11	Approved	Yes
KOMOROWSKI	Arroyo Verde	Existing Urban (R-1-7)	SF	1	6	Approved	Yes
YING	Arroyo Verde	SF	SF	3	4	Approved	Yes
PRISKE	Thille	PR-20	Apt.	26	400	Pending	No

CHART 10 - APPROVED* AND PENDING PROJECTS (1/1/89)

PROJECT	LOCATION COMMUNITY	LAND USE DESIGNATION	TYPE OF DU	ACREAGE	DU	STATUS	AQMP
WESTON (WEST RANCH)	Thille	PR-20	Apt.	36	84	Approved (+190 already built)	Yes
			Apt.		144	Pending	No
			Condo.		105	Approved (+108 already built)	Yes
			Condo.		217	Pending	No
FREDRICKS	Thille	PR-20	Condo.	12	164	Pending	No
WESTON (EAST RANCH)	Thille	PR-20	Apt. Condo.	23 14	204 266	Pending	No
FREDRICKS	Thille	PR-20	Apt.	37	480	Pending	No
COUNTY CENTER (TOWBES)	Thille	PR-20	Apt.	21	268	Approved	Yes
PARKSIDE	Montalvo	Existing Urban RPD-13)	Condo.	24	81	Approved (+160 built)	Yes
McCUNE	Poinsettia	HPR-4	SF	18	3	Approved	Yes

CHART 10 - APPROVED* AND PENDING PROJECTS (1/1/89)

PROJECT	LOCATION COMMUNITY	LAND USE DESIGNATION	TYPE OF DU	ACREAGE	DU	STATUS	AOMP
WOLTER	Poinsettia	HPR-4	SF	54	7	Approved (+23 already built)	Yes
COBBLESTONE	Poinsettia	Existing Urban (RPD-3)	SF	6	3	Approved (+9 already built)	Yes
CHERRIE	Juanamaria	SF	SF	30	124	Pending	No**
GLENFED	Juanamaria	SF	SF	41	295	Approved	No**
HERTEL	Juanamaria	SF	SF	29	195	Approved	No**
PRESLEY	Juanamaria	PR-8	Condo. SF	13 36	109 174	Pending Pending	No
HAMMER-HEWSON	Juanamaria	SF	SF	19	107	Approved	No**
SALVATION ARMY	Serra	PR-20	Apt.	4	74	Approved	Yes
WITTENBERG	Saticoy	PR-8	SF	29	167	Approved (+155 already built)	Yes
SATICOY HOUSING	Saticoy	Existing Urban (R-1-6)	SF	.7	4	Pending	Yes

CHART 10 - APPROVED* AND PENDING PROJECTS (1/1/89)

PROJECT	LOCATION COMMUNITY	LAND USE DESIGNATION	TYPE OF DU	ACREAGE	DU	STATUS	AQMP
AFFORDABLE COMMUNITIES (JACOBS)	Saticoy	PR-8	SF	24	153	Pending	No
WITTENBERG	Saticoy	PR-8	SF	14	77	Pending	No
WITTENBERG	Saticoy	PR-20	Apt.	2	20	Approved	Yes
WITTENBERG	Saticoy	PR-8	SF	18	100	Pending	No
KNM DEVELOPMENT	Wells	PR-8	SF	48	280	Pending	No

TOTAL APPROVED:	SF	902	TOTAL PENDING:	SF	1,092
	Condo.	190		Cond.	878
	Apt.	589		Apt.	1,310
	Total	1,681 DU		Total	3,280 DU

TOTAL APPROVED AND PENDING: 4,961 DU

Source: Pending Projects, City of San Buenaventura, 1989

*Approved = all discretionary approvals obtained as of 1/1/89.
**Project subject to already approved development agreement, which provides commitment to AQMP population allocation; population not yet subtracted from available AQMP population, however.
***Project would require a Comprehensive Plan amendment.

In addition to the projects listed, approximately 35-40 dwelling units are developed annually under the 1-4 unit set-aside exemption category under the AQMP.

A pending amendment to the Downtown Redevelopment Area Plan would increase the number of dwelling units allowed there by 500.

The Comprehensive Plan identifies nearly 200 acres of flatlands formerly designated for agricultural use as potentially available for residential development, in addition to the properties with specific residential development proposals. The hillside areas designated for residential development cover over 7,000 acres. This is in addition to areas such as the "Mound Property" located east of Victoria Avenue in Montalvo, which could support over 200 units; scattered, smaller parcels estimated to be able to support over 300 units; and over 200 acres of residentially designated land not previously accounted for in the Saticoy and Wells Communities capable of supporting over 1,000 units.

A population of up to 115,000 can be accommodated by the Year 2010 with lands designated for residential development under the Comprehensive Plan, assuming imported water can be secured to augment local supplies. Thus, the availability of suitable sites is not the limiting factor with respect to meeting the regional share allocation for the City.

Regardless of any changes in land use designations and zoning designations, or projects to extend local public services and facilities, three major constraints combine to limit the City's ability to meet housing needs:

(1) Federal, State, and regional mandates with respect to air quality;

(2) Limited water supplies; and

(3) Dramatic increases in the cost of land throughout the region and coastal California.

These constraints, along with others that influence the ability to meet housing objectives, are addressed in the ensuing section of this document.

V. GOVERNMENTAL AND NONGOVERNMENTAL CONSTRAINTS

Of major concern in developing housing programs are the potential and actual constraints on housing development and maintenance. These fall into two categories, governmental and non-governmental. This section analyzes such constraints.

A. GOVERNMENTAL CONSTRAINTS

1. Land Use Controls

The major source of governmental constraints on housing is land use controls. The City has several programs and policies, implemented to meet adopted goals, which may have the effect of constraining housing. These are discussed below.

a) Open Space Designations: The City's Land Use Plan Map designates over 3,000 acres "Agricultural Use - not to be reconsidered until after 2010." The designation effectively removes this acreage from the inventory of available developable land in order to maintain a viable agricultural industry. Other lands are in the Flood Plain or in Sensitive Habitat areas, or are park or recreation areas. (Refer to Land Use Plan Map.)

b) Capital Improvement Deficiency Studies: The Comprehensive Plan requires Capital Improvement Deficiency Studies in areas where roads, water, sewer, parks or other public service constraints exist which limit development. The Capital Improvement Deficiency Study requirement is intended to ensure that development patterns are orderly, efficient and economically feasible in terms of providing public facilities and services, and that urban services are available to accommodate new development.

Discretionary planning approvals are not allowed in an area subject to a Capital Improvement Deficiency Study until such a study is prepared and approved. This applies to both residential and non-residential projects.

The Land Use Element identifies an area of roughly 300 acres in the Saticoy and Wells Communities that is subject to being opened to development when a Capital Improvement Deficiency Study has been completed. Such a study has already been initiated in this area.

Capital Improvement Deficiency Study requirements also apply to large portions of the City's Hillside Area which have not yet been developed. Such studies are to be carried out in the hillsides by Planning Community.

c) Hillside Management Program: The Hillside Management Program regulates the development of the City's hillside areas, with specific reference to geologic hazards, aesthetics, access, drainage, density and site development. These regulations have the effect of increasing the costs of hillside housing in response to physical constraints faced in hillside development, such as steep slopes, unstable soils, and erosion potential.

d) Air Quality Management Program: The City's Air Quality Management Program (AQMP) was adopted to help meet Federal Air Quality Standards. This program has limited residential building permits to approximately 300-400 per year. Housing units are controlled through an allocation system. Residential projects are periodically reviewed, and all competing projects are scored on the basis of a point system. This scoring system is outlined in the AQMP project evaluation criteria. The

higher scoring projects have a better chance of receiving population allocations. Points are given based on location, site design, traffic circulation, recreational features, environmental impacts, energy and water conservation, and provision of affordable housing. Thus, this program has two opposing effects on housing: on the one hand, it limits the number of available units; and, on the other hand, it provides strong incentives for provision of affordable housing. Through this program the City has obtained a significant number of low-income, subsidized housing units that otherwise would have been difficult or impossible to develop.

A critical factor in evaluating this constraint is that the City's AQMP is part of the County's Air Quality Management Plan, which is mandated to meet Federal Air Quality Standards. Compliance with the Plan is required under State and Federal law.

2. Building Codes and Zoning Ordinance

The City has adopted and continues to use and enforce the Uniform Building Code developed by the International Conference of Building Officials. This Code, and its effects, are fairly standard throughout California. The use of some older structures may also be affected by requirements applicable to unreinforced masonry structures to reduce hazards from potential earthquake damage.

The Zoning Ordinance controls such factors as building density, setbacks, and parking. These requirements may constrain both development of new housing, and maintenance and rehabilitation of the existing housing stock, where units may not be in compliance with current ordinance provisions.

3. Residential Permit Processing and Fees

a) Time Constraints: Residential projects of over 20 units are currently subject to the Air Quality Management Program discussed above. Project applications are accepted only periodically, and all projects are reviewed simultaneously. The review process takes approximately seven months. After a project receives an allocation, it is necessary to obtain the required discretionary planning permits, such as annexation, zoning approval, and tentative tract map. This process usually takes three to six months if the developer proceeds expeditiously.

Residential projects of 20 units or less need not go through the full AQMP process, though resulting population from these projects is still counted under the program. These projects can usually obtain their permits in approximately three to four months, unless there is a special problem with the project. The popularity of the 5-20 unit set-aside program has, however, resulted in a waiting list being established in recent years for those interested in participating.

b) Fees and Exactions: Various fees are involved in the development and construction of housing. The costs vary depending on the size of the building, the lot, and the tract, whether any capital improvements are needed at that location, the size of the water service, and other factors. Assuming a single family dwelling of 2,000 square feet with a 440 square foot garage, 3 bedrooms and 2 baths, on a 7,000 square foot lot, with a 3/4" water meter, and a value of $124,404, the fee, as of February 1987, was $5,411.52. This was substantially lower than the fees charged by other nearby

cities which ranged from $7,396.61 (Camarillo) to $12,211.55 (Oxnard) when the most recent comparative analysis was conducted.

Because of growing traffic concerns in the City, traffic impact mitigation fees have been established. These now total from $1,190 to $5,245 per residential dwelling unit, and are in addition to the fees identified in the 1987 comparative analysis.

Every proposed project is subject to the environmental review process required by the California Environmental Quality Act (CEQA). As a result of project impacts identified through this process, other on or off-site improvements to road, water, sewer, drainage or other utility or service systems may be required to mitigate impacts on a project-by-project basis.

4. Noise and Safety Element Policies

The Noise Element contains a policy which discourages residential development where the Community Noise Equivalent Level (CNEL) exceeds 65dB. In Ventura, this is primarily along the freeway corridors. (Noise contours are shown on maps in the Noise Element Technical Appendix.) This limits the supply of land available for residential development.

The Safety Element includes development restrictions based upon a variety of geophysical constraints, including flooding, seismic (earthquake) hazards, and wildfire hazards. (Refer to Safety Element and Safety Element Technical Appendix.) These constraints are a result of the City's location between two rivers, the ocean, and mountainous areas; the presence of potentially active faults; and limited rainfall. Measures to address these constraints

limit building, or increase the cost of housing, but are necessary to protect public safety.

5. Article 34 Court Decision Impacts

The California Supreme Court's decision on Davis vs. City of Berkeley in late 1988 placed restrictions on voter approval of funding for low-income housing projects by requiring more specific information be provided for such measures regarding individual sites and projects. The Davis decision, based upon Article 34 of the State Constitution, appears to require information sufficient to identify fiscal and aesthetic effects. Normally, this type of information has been developed after funding has been approved.

This constraint is now faced by all cities and counties in California.

B. NON-GOVERNMENTAL CONSTRAINTS

1. Availability of Water

The continuing development of residential (and non-residential) land in the City is directly dependent on the availability of water to serve the added population. The current City water supply, from Lake Casitas, the Ventura River, and existing wells, can serve a maximum population of approximately 102,000. This is the basis of the alternative evaluated in the Comprehensive Plan Update Master EIR which shows 102,000 as the ultimate population. Even if the population were to not grow beyond 102,000, water quality concerns, particularly with respect to groundwater sources, suggest the need to augment local supplies with imported State water.

Before the City can grow beyond this population it would be necessary to obtain water from new sources. The primary source under consideration is importation of State water. In 1971 the City acquired the rights to 10,000 acre feet of State water. Several million dollars have been paid for this water. These costs are for rights to the water and do not include the costs of transporting the water from the reservoirs at Castaic or Pyramid Lake to the City. The City, together with the United Water Conservation District and the Casitas Municipal Water District, contracted for a study to determine the feasibility of importing State water into Ventura. The study reviewed the need for this water, and evaluated alternative routes for transporting the water, along with the costs for each alternative. Total capital cost of the recommended alternative is estimated at up to $120 million. The cost would be shared among benefiting water purveyors. Additional investigation is under way to identify how the project might be made more cost effective for the City.

The lack of additional water, or the expense of providing more water, will certainly impact development of housing for all income levels. It has not yet been decided how the money to import State water will be raised. It is likely that the costs of providing additional water will fall on current as well as future residents.

The City also has an active water conservation program to maximize the efficient use of available supplies.

2. Cost of Land and Construction

The cost of land has steadily risen in the City, as in the rest of Southern California. According to the Construction Industry Board, the cost of improved residential land rose approximately 300% from 1970 to 1980. Land costs accounted

for 27.8% of the total cost of a residential unit in 1980, versus 21% in 1970. Land costs have increased even more rapidly in recent years. Land costs in coastal Southern California are among the highest in the country.

The high cost of land may also inhibit the maintenance of existing units, because it may be more cost-effective to demolish an existing structure and rebuild than to maintain or improve the existing facility.

Construction costs increased 132% in the ten years between 1970 and 1980. Construction became a smaller portion of the total cost, decreasing from 56% to 42.5%. Land costs alone make new construction of low income units virtually impossible without subsidies, and even moderate income level housing extremely difficult.

Housing costs in Ventura County are now among the highest in California.

3. Cost of Financing

A major component of increasing housing prices is the cost of financing, including construction financing, mortgage financing for home purchase and resale, and refinancing for resale of rental properties.

According to the Construction Industry Board, the cost of construction financing increased 465% from 1970 to 1980. Construction financing went from 6.5% to 12% of the total cost. The cost of borrowing money for housing development continued to rise until 1985, when interest rates began to decline and stabilize. These trends, though the exact numbers may vary, are also apparent in the areas of housing resale and rental property resale. The costs of the earlier increases have substantially affected housing prices in all

sectors, including the original sales price of ownership housing, the cost of purchasing existing ownership housing, and all rental rates. These costs have proved to be a substantial barrier in the provision and maintenance of affordable housing.

4. Public Improvement Constraints

Significant public improvement constraints other than overall water supply have been identified in several areas. There are 153 acres in the Wells Community and 145 acres in the Saticoy Community which fit this description. Development of the Wells Community acreage would have an impact on City collector roads, most notably Foothill Road. The need to widen this roadway would be accelerated if additional development were to occur in this area. The need to widen or construct bridge crossings at Brown Barranca would also be accelerated.

Development of the 145 acres in the Saticoy Community, which are located in the former "Saticoy Subarea II," would have impacts on State Highway 118 and Brown Barranca that cannot be readily mitigated due to the need for State involvement in these projects. Other impacts would include the need for a sewer lift station and added sewer line capacity, fire protection, and park facilities.

State improvements to Highway 118 are currently scheduled to occur in the next three to four years. In addition, a Capital Improvement Deficiency Study is under way for the entire area.

Capital Improvement Deficiency Studies will determine on- and off-site improvements required to alleviate the deficiencies in the Saticoy and Wells Communities and undeveloped Hillside Areas. A similar process was previously used

in the Juanamaria Community, where needs were identified through a Capital Improvement Deficiency Study, and addressed in development agreements for several large projects.

The City's Traffic Impact Mitigation Fee Program is designed to help address funding needs for a series of critical transportation system improvements throughout the City resulting from cumulative impacts of new development. The Circulation Element identifies needed road improvements throughout the Planning Area.

5. Air Quality

As noted in the description of the City's AQMP under governmental constraints, some State and Federal Air Quality Standards are being exceeded in Ventura County. Part of the County-wide strategy to address this problem, which presents a public health concern, is to limit population growth.

VI. PROGRESS REVIEW

A. OVERVIEW

State housing law requires periodic updating of housing elements. As part of this updating process, local jurisdictions are required to evaluate their progress in implementing the Housing Element, their effectiveness in attaining the community's housing goals and objectives, and the appropriateness of the element's goals, objectives, and policies in contributing to the attainment of the State housing goal. The following section presents this evaluation.

Overall, the City has made substantial progress in implementing housing programs contained in the 1981 Housing Element, and several targets have been met or exceeded. At the same time, the City has lost ground in meeting housing needs, especially in terms of affordability, largely because of regional economic and population growth beyond Ventura's ability to control. The SCAG Region's (Ventura, Los Angeles, San Bernardino, Riverside, Orange and Imperial Counties) population has grown to over 13 million people, and has been projected to grow by another five million persons by the year 2010.

Coastal Southern California has some of the highest housing costs in the country. As one of the most desirable locations to live within the region, the City has experienced unprecedented upward pressure on housing costs. In 1988, the median resale price of a single family home rose to over $200,000. These trends have placed home ownership beyond the reach of most first-time buyers, and seriously constrained meeting the needs of lower income groups in particular. Given these powerful regional trends, the City's primary challenge is to moderate the deterioration of local housing affordability. Realistically, fully satisfying all local housing needs is not possible in the foreseeable future.

Accomplishments under each of the programs in the 1981 Housing Element are described below. The progress described in meeting program objectives, and overall housing goals, objectives, and policies is an important factor in identifying changes needed in the Housing Element.

B. HOUSING PROGRAM PERFORMANCE

1. Housing Needs Assessment Program

This program was proposed in the 1981 Housing Element to monitor housing information and periodically reassess and update the City's housing needs. This has been accomplished through inclusion of a "Housing Needs" section in the City's Community Development Report. This program did not have any quantified objectives. It also needs to be modified to address all of the needs which now must be considered in housing elements.

2. Housing Incentives Program

The Housing Incentives Program has offered incentives through the City's Air Quality Management Program (AQMP) for private developers to provide lower income housing. The AQMP limits population growth on a County-wide basis as part of the strategy to control air pollution and help meet State and Federal Air Quality Standards.

Market rate projects larger than 20 units are subject to project evaluation criteria which implement the AQMP. Under this program, proposed projects are evaluated on a competitive basis, and assigned numerical point scores, with a maximum of 100 points.

The Housing Incentives Program has offered bonus points under the scoring system for providing units available to lower income households. Bonus points may be earned by selling land to the Housing Authority for use in developing low income units, making rental or ownership units available through the City's Affordable Housing Program, or making ownership units available through a single family mortgage revenue bond program.

The quantified objective for affordable units under this program was 178 units. During 1982-86, 165 affordable units were developed under the Housing Incentives Program.

3. Affordable Housing Program

The Affordable Housing Program has operated in conjunction with the Housing Incentives Program by specifying standards for affordable ownership and rental units. It sets out mechanics of the sale and resale process. The numerical target for this program was included in the 178 dwelling units cited under the Housing Incentives Program. From 1982 through 1988, 420 dwelling units were provided under the City's Affordable Housing Program. Thus, the objective of 178 dwelling units under this program was exceeded by 242 units.

4. Mortgage Revenue Bond Financing

The City, Housing Authority, or Redevelopment Agency can issue housing revenue bonds to provide lower interest financing for ownership or rental lower income housing. Assistance for 60 units was specifically identified as an objective.

The City has issued or participated in four single-family mortgage revenue bond programs. Approximately 305 units

have been sold under this program, with another 125 under construction. The City also issued a tax exempt bond for rental housing, providing construction financing for 400 units, of which 80 are being made available to low or moderate income households.

Unfortunately, recent legislative changes affecting the tax-exempt status of such bonds has severely restricted local governments' ability to make additional bond issues in the future.

5. <u>Housing Rehabilitation Program</u>

This program has maintained the affordable housing stock through low interest and deferred payment rehabilitation loans. Loans have been used to repair structural defects, replace worn out and obsolete electrical systems, plumbing and roofs, and correct Building Code violations.

The numerical objective of approximately 15 units per year has been met, with over 100 units rehabilitated over the past seven years.

6. <u>Land Banking Assistance Program</u>

The City initiated a Land Banking Assistance Program by setting aside approximately $160,000 in 1980. These funds, together with other City and Redevelopment Agency funds, have been lent to the Housing Authority at low or no interest, to enable purchase of sites for housing projects. Site control gives the Housing Authority a significant advantage in competing for HUD's low income housing funds. Since the program's inception, the City has assisted the Housing Authority with land purchase funds in excess of $450,000.

No numerical objectives were set forth for this program.

7. Federal and State Housing Programs

Federal housing programs have been a major resource in providing housing for lower income households. These programs have been administered by the City's Housing Authority, an autonomous agency. The primary programs have been:

(1) Section 8 Housing Assistance Payment Program, which is a rent subsidy program, and

(2) Conventional Housing Program, which involves housing owned, managed and maintained by the City Housing Authority.

A numerical objective of 140 new units was set forth in the 1981 Housing Element. No specific objective was presented for the Section 8 Program. The Housing Authority was successful in developing 180 units over the past seven years. Of these, 120 units were for seniors and 60 for families. The Housing Authority assists over 650 households with Section 8 or voucher certificates.

8. Technical Assistance Program

The Technical Assistance Program has provided assistance for private, non-profit groups and private developers seeking to build low and moderate income housing. Such assistance has included:

- Information on current State and Federal housing programs;

- Information on tax incentives for low and moderate income housing;

- Assistance in filling out applications; and

- Assistance with State and Federal agency processing requirements.

No numerical objectives were set forth for this program.

9. Condominium Conversion Ordinance

A Condominium Conversion Ordinance was prepared as a revision to the City's Zoning Ordinance, and approved during 1982. The ordinance requires findings that a proposed conversion would not adversely affect supply and availability of rental housing in the City or a specific area of the City. It further requires that if the vacancy rate is lower than 5%, new rental units must be constructed by the applicant to equal or exceed the number of units proposed to be converted, and relocation assistance must be provided to displaced tenants.

No numerical objectives were established for this program.

10. Factory Built Housing Ordinance

This effort was undertaken in response to State legislation dealing with placement of manufactured or factory built housing on lots zoned for single family development. The City's Zoning Ordinance was revised to allow manufactured or factory built housing to be located in any single family zone provided that the roof and siding materials are non-reflective, and roof overhangs are a minimum of 1½ feet.

No numerical objectives were furnished for this program.

11. Residential Energy Conservation

This program has encouraged energy conservation through incentives in the AQMP project evaluation criteria.

No numerical objectives were established for this program. These incentives have, however, encouraged several projects which were later approved to incorporate energy conserving features.

VII. HOUSING PROGRAMS

A. INTRODUCTION

This section describes the housing programs that the City is or should be undertaking to help meet the housing needs identified in Sections II and III of this Appendix. Some of these programs are already in operation and should be continued. Modifications are recommended in some cases. Other programs are entirely new.

The discussion of each housing program is divided into three sections: Program Description, Quantified Objectives, and Implementation. The Program Description includes the purpose of the program, the issues(s) and/or policies it addresses, and a discussion of how it works. The Quantified Objectives contain, whenever possible, numerical goals, in accordance with the requirements of Section 65583(b) of the Housing Element Guidelines. The Implementation Section covers Administrative Responsibility, Funding, and Scheduling.

Each program describes a specific approach to a housing problem. No program taken alone can meet all housing needs. Often two or more programs are needed to achieve an objective; for example, revisions to the non-conforming provisions of the Zoning Ordinance (Program No. 5) may be needed in order for rehabilitation of some low income residences (Program No. 4) to occur. For this reason, the numeric objectives stated after each program are not cumulative; the same units may be counted under two or more programs.

In addition to the programs described below, the City has also provided funding support to non-profit organizations, such as the Association for Retarded Citizens and Project Understanding, which provide services to particular target groups on a continuing basis.

B. HOUSING PROGRAMS

1. Affordable Housing Program

a. Program Description: This program provides incentives to private developers to construct the types of housing needed to meet identified needs. The current Affordable Housing Program was approved in September 1988. (See Exhibit 3 for informational purposes.)

The Affordable Housing Program provides incentives for 100% affordable ownership or rental projects. These incentives include:

- Exemption from the City's AQMP project evaluation criteria -- projects over 20 units now normally require several years to secure a population allocation under the competitive AQMP;

- City Council prescreening -- application fees are refunded for projects which do not pass the prescreening process;

- The ability to enter into development agreements; and

- Allowing simultaneous processing of any needed Comprehensive Plan amendments and other discretionary approvals.

The amended program also contains strong resale controls.

Three 100% affordable housing projects (Affordable Communities, Wittenberg and KNM) passed the City Council prescreening process in early 1989, and they

include a potential total of over 430 affordable units. As of August 1989, these proposed projects are undergoing environmental review.

The Land Use Element designates an approximately eight-acre site in the Downtown Community, west of Sanjon Road and south of the Southern Pacific Railroad, for Planned Mixed Use Development (PMXD), emphasizing residential development for senior citizens under the City's Affordable Housing Program. It also designates three sites as Planned Residential, subject to providing a 100% affordable project, or if the project is otherwise found by the City Council to be "of great benefit" to the City. These sites include an approximately 50-acre site in the Serra Community, west of the Sudden Barranca and south of the Southern Pacific Railroad; an approximately 95-acre site located in the Saticoy Community south of the Southern Pacific Railroad, east of Saticoy Avenue, and west of Brown Barranca; and an approximately 24-acre site also in the Saticoy Community, between the Santa Clara River and the railroad, and west of Cabrillo Village.

The City should continue to investigate and develop additional incentive programs for needed types of housing. This will require the Department of Community Development to monitor housing legislation, coordinate with other jurisdictions to learn of new programs being developed around the state and nation, and develop new programs suited to local circumstances.

Several ideas for low and moderate income housing incentives were suggested through public review of the Housing Element. These included:

1) Postponement or reduction of development fees for low income housing;

2) Modification of development standards, on a case-by-case basis, for low income housing;

3) Fast tracking of development permits and/or simultaneous processing of permits (this has been included in the Affordable Housing Program dealing with 100% affordable projects);

4) Setting up guidelines for the use of a housing trust fund, and investigating resources and mechanisms to fund one, including AQMP affordable housing points;

5) Working with non-profit and private developers to create low and moderate income housing; and

6) Reserving a portion of the 20% small project set-aside for low income housing.

These ideas should be considered as possible additional incentives for low income housing.

In addition to these low income housing incentives, the City may wish to consider creating incentives for developers to provide or encourage day care facilities within their projects. This might involve simply providing a suitable building and play area, to be leased to professional providers of day care. Inclusion of such a facility would not reduce the density or number of units permitted in the project.

Day care programs are continually faced with difficulties in finding and keeping suitable facilities;

therefore, this type of program would make it much easier to locate day care convenient to housing. Alternatively, commercial and industrial developers might contribute a fee toward creation of day care facilities.

The Land Use Element contains a policy calling for the City to include provisions to encourage projects to offer land for community service facilities as part of the AQMP project evaluation criteria.

This program addresses Housing Element Objectives 1 and 7 and Policies 1.1, 1.2, 1.3 and 9.4.

b. Quantified Objectives: The City's objective is to see 275 new affordable units constructed over the next five years under this program.

c. Implementation:

1) Administrative Responsibility. The Affordable Housing Program is administered by the Department of Community Development. New housing incentive programs would also be investigated, developed and carried out by the Department of Community Development, under the guidance of the City Council Ad Hoc Committee on Affordable Housing. Implementation may also be assisted by agreements with non-profit or private firms.

2) Funding. No new funding is required for this program, nor would additional staff positions be required to operate it.

3) Schedule. This is an ongoing program. The Community Development Department will monitor housing

legislation and new program opportunities as they occur. A package of additional low income housing incentives should be identified within one year of adoption of the revised Housing Element. This would be the responsibility of the Department of Community Development.

2. <u>AQMP Affordable Housing Incentives</u>

a. <u>Program Description</u>: The City currently has an Air Quality Management Program, which controls the number of residential units which will be approved each year. Competition for allocation of residential unit approvals is intense. Developers may significantly improve their chances for project approval by providing some type of needed housing, including rental housing at any income level, affordable housing for first-time homebuyers, and/or the sale of land to the Housing Authority for construction of subsidized housing.

1) Rental Housing. The AQMP Incentives Program currently encourages rental housing by providing an exemption for rental housing projects constructed by the Housing Authority or a similar nonprofit entity, providing the following criteria are met:

- At least 80% of the funding for the project is through the U.S. Department of Housing and Urban Development.

- The units are developed and managed by the entity that receives the exemption. Any change in development or management of the units is

not allowed unless specifically approved by the City Council.

In addition, bonus points are awarded under the AQMP project evaluation criteria for projects which would include affordable rental units under the City's Affordable Housing Program. This enhances the potential for such projects to receive development allocations.

2) Ownership Housing. Developers wishing to enhance the chances for approval of their ownership projects may provide affordable housing pursuant to the City's Affordable Housing Program. Substantial bonus points under the AQMP are awarded to these projects, enhancing their chance to receive a development allocation.

3) Housing Authority. The final way for developers to earn affordable housing points is to sell land to the Housing Authority for development of federally subsidized housing. Many developers have taken advantage of this option. This program has been extremely successful, since the Housing Authority's chances of obtaining funding for its projects are significantly improved when it is able to show site control at the time of application to HUD for project funding.

The Land Use Element contains a policy calling for a mechanism to be included in the AQMP project evaluation criteria whereby affordable housing will be given priority in allocations. The Housing Element includes a policy to consider adding an Affordable Housing set-aside under the AQMP (or any successor program).

This program addresses Housing Objectives 1, 2 and 7 and Policies 1.1, 1.2, 1.4, 1.6 and 2.1.

b. Quantified Objectives: The number of apartment units is forecast to average 30% of the total AQMP allocation. This would work out to approximately 634 rental units during the five-year period 1989-1994. (This assumes an AQMP population of 504 in 1989 and 1,100 per year in 1990-1994, with 30% of the total number of units assumed to be apartments, and 1.7 persons per apartment.)

The Affordable Housing Program was recently revised and there is little track record to assist in predicting future numbers. A reasonable expectation would be 10% of the ownership units available for allocation. There are approximately 1,479 ownership units available for allocation through 1994; 10% of this is 148 units made available through the AQMP Affordable Housing Incentives Program.

The Housing Authority has developed approximately 25 units per year with assistance from the AQMP since its inception. Projecting this into the future, approximately 125 such units would be built in the five-year period 1989-1994. Because of declining HUD funding, this target has been reduced to 70 units.

c. Implementation:

1) Administrative Responsibility. The AQMP Affordable Housing Incentives are administered jointly by the Revitalization and Planning Divisions. Preparation of revisions to the AQMP project evaluation criteria will be the responsibility of

the Planning Division staff, under the guidance of the City Council Ad Hoc Committee on Affordable Housing.

2) Funding. No new funding is required for this program, nor would additional staff positions be required to operate it.

3) Schedule. This program is recurring, operating when project evaluations for AQMP are prepared. Revisions to the AQMP project evaluation criteria are to be prepared within the next year following adoption of the Comprehensive Plan update in 1989.

3. Density Bonus Program

a. Program Description: The Density Bonus Program, mandated by State law, offers developers a 25% increase in density in exchange for provision of 25% of the project as low or moderate income housing. It is left to local jurisdictions to specify the exact standards for the low and moderate income housing. Developers who wish to qualify for a density bonus with ownership housing must meet the interest rate and housing price standards of the Affordable Housing Program. Developers who wish to qualify with rental housing must lease the bonus units to the Housing Authority at HUD's Fair Market Rents.

This program addresses Objectives 2 and 7 and Policies 1.3, 9.1 and 9.2.

b. Quantified Objectives: This program is dependent on developer initiative, which makes numerical objectives difficult to define. Based upon past trends, three to

four density bonus units have been constructed per year. The target for 1989-1994 is, therefore, 20 dwelling units.

c. Implementation:

1) Administrative Responsibility. This program is administered by the Department of Community Development.

2) Funding. No new funding is required for this program, nor would additional staff positions be required to operate it.

3) Schedule. This program operates continuously.

4. Housing Rehabilitation Program

a. Program Description: The City has a Housing Preservation Program (HPP) which provides for the rehabilitation of affordable housing. The HPP has two components, ownership and rental housing, that are funded from separate HUD programs.

The ownership program offers below market rate (currently at 6%) loans to owner-occupants of one to four unit residences. The owner's income must be at or below 80% of the HUD median for Ventura County, adjusted for family size. Most loans are amortized over 15 years, but deferred loans are available under special circumstances.

The rental program offers below market rate (currently at 4½%) loans to rehabilitate low income, investor-owned units. These units must rent at or below HUD's Fair Market Rents (FMR) for the County.

This program has been successful in maintaining the City's stock of affordable housing. Maintenance of existing older housing is cheaper than building new affordable units. Usually, rent controls or subsidies are not required to keep the housing affordable after rehabilitation.

This program addresses Objective 3 and Policies 3.1, 7.1 and 7.2.

b. Quantified Objectives: The Housing Preservation Program is projected to allow rehabilitation of about 15 units per year, or 75 units in the five-year period of 1989-1994.

Implementation:

1) Administrative Responsibility. The Housing Preservation Program is administered through the Revitalization Division of the Department of Community Development. No additional staffing would be required to continue the program at the level of effort indicated.

2) Funding. The single family program is funded from the City's Community Development Block Grant (CDBG) funds at approximately $150,000 per year. The Rental Rehabilitation Program is funded 50% from HUD's Rental Rehabilitation Program, and 50% from matching CDBG funds, requiring about $60,000 per year of CDBG funds. No additional funding is required to continue this program at the level of effort indicated; however, it is wholly dependent on HUD funding.

3) Schedule. This program operates on a continuing basis, and can operate at this level as long as HUD assistance is available.

5. Revisions to Non-Conforming Use Sections of Zoning Ordinance

a. Program Description: As described above, the City's Housing Preservation Program rehabilitates low-income rental properties. An obstacle to rehabilitation of more such units is the non-conforming use provisions of the City's Zoning Ordinance. These sections now require that a building may not be "structurally altered" unless the property is brought up to current code requirements, including parking and density. What may happen is that a property owner applies for a loan to rehabilitate a badly deteriorated, often unsafe rental property. During the loan review process, it may be found that the property has two or three more units than are permitted under current zoning limitations, and lacks several of the required parking spaces. This is particularly true in the older sections of the Avenue Community, where many small studio and one-bedroom units are built on long narrow lots. Under the non-conforming use requirements, the property owner must tear down the excess units and provide the additional parking in order to make the necessary foundation improvements which are classed as "structural alterations." On learning this, the property owner may withdraw their application, and the property would continue to deteriorate.

The Housing Element contains a policy stating the City should consider amending the Zoning Ordinance to facilitate rehabilitation of non-conforming units.

This program addresses Objective 3 and Policies 2.1 and 3.2.

b. Quantified Objectives: This program would represent a one-time effort, and does not lend itself to numerical objectives.

c. Implementation:

1) Administrative Responsibility. This program would be carried out by the City Department of Community Development's Planning Division.

2) Funding. No new funding would be required for this program. A comprehensive Zoning Ordinance revision project is already under way.

3) Schedule. This program should be carried out within two years of adoption of the Comprehensive Plan Update.

6. Fair Housing/Tenant-Landlord Relations

a. Program Description: This program would provide information and referral services for problems between tenants and landlords. A designated staff member would perform this function. This effort is currently being carried out on a case-by-case basis by various departments within the City, chiefly the City Information Agency. This program would consolidate and centralize the function. The City should also facilitate efforts by non-City agencies to resolve these questions. To the extent that these questions deal with fair housing issues, this effort will help meet HUD requirements for a fair housing program in the City.

This program addresses Objective 10 and Policy 10.1.

b. Quantified Objectives: The City's objective is to provide assistance for approximately 1,200 requests under this program over five years, based on 20 requests per month.

c. Implementation:

1) Administrative Responsibility. This is not a new function, but rather the formalization of an existing one that has grown substantially in the last few years. It would involve the designation and training of an existing staff member.

2) Funding. CDBG funding may be required for this program, to fund an additional position or part of a position.

3) Schedule. This effort should be carried on a continuing basis.

7. Mortgage Revenue Bonds

a. Program Description: Federal legislation has allowed the issuance of mortgage revenue bonds to provide low interest home mortgages to first-time homebuyers qualified on the basis of income. The City has issued or participated in four such bond issues. However, changes in tax regulations have tightened the requirements for income levels to the extent that such bonds currently are not feasible in California.

It has also been possible to issue multi-family mortgage revenue bonds to provide long-term, low interest

financing for the construction of new rental complexes. Again, however, tax reforms have so tightened the requirements that these issues are not particularly desirable from a financial standpoint.

Although these bonds are not feasible under current conditions, the City should monitor changes in bond requirements and housing market conditions and be prepared to move back into the bond market should it become attractive again.

This program addresses Objective 5 and Policies 5.1 and 6.2

b. Quantified Objectives: No numerical objectives are included for this program because of current constraints imposed by tax law changes. An objective will be introduced if this situation is altered.

c. Implementation:

1) Administrative Responsibility. The City Department of Community Development should carry out the necessary monitoring.

2) Funding. No new funding is identified for this program, nor would additional staff positions be required to operate it, unless circumstances change to make new bond issues feasible.

3) Schedule. The monitoring effort would be continuous; the program would be restarted when feasible.

8. <u>Federal and State Housing Programs</u>

a. <u>Program Description</u>: The major provider of housing for low and very low income households is the Housing Authority, which is funded primarily through the Federal Department of Housing and Urban Development (HUD). The Housing Authority administers both Conventional Housing and Section 8 Housing Programs.

A family voucher program supplements the Section 8 program and may eventually replace it. With a voucher, a household still receives the difference between 30% of its gross monthly income and the applicable Fair Market Rent (FMR) as a rent subsidy. However, the household is not limited to units renting at or below that rate; they may rent any unit providing they pay, in addition to the 30%, the difference between the FMR and the unit's rental cost.

The City can assist the Housing Authority in a variety of ways.

1) Legislative Liaison. In recent years, the Federal Government has severely cut back funding for these types of programs. The City can work through its representatives in the Legislature and Congress to attempt to preserve and expand funding for these programs.

2) Site Location. The Housing Authority obtains funding for new low income housing by applying to HUD for grants. Chances of receiving such funding are greatly enhanced when the Housing Authority has site control of a property on which to build the units. In the past, sites have been made available to the Housing Authority through

the AQMP Affordable Housing Incentives Program. The City should continue this program.

This program addresses Policies 2.1, 2.2, 6.2, 9.1, 9.2 and 9.3.

b. <u>Quantified Objectives</u>: Based on the Housing Authority's record of developing approximately 25 units per year, an additional 125 units would be built over the next five years. Section 8 or voucher program rental assistance is forecast for 20 additional households per year, which equates to a five-year objective of 100. This objective may be optimistic because HUD has severely cut back funding for such projects in recent years.

c. <u>Implementation</u>:

1) Administrative Responsibility. The City's Legislative Liaison would coordinate the lobbying functions to preserve housing funding. The Department of Community Development should monitor AQMP incentives to ensure that the Housing Authority is being offered opportunities to purchase needed land.

2) Funding. No new City funding is required for this program, nor would additional staff positions be required to operate it. Continued HUD support of the Housing Authority is critical.

3) Schedule. The legislative liaison function would be continuous, and Housing Authority efforts would also be ongoing.

9. Transitional Shelter for Homeless Families

a. Program Description: Legislation enacted during 1986 requires local housing elements to identify sites for emergency shelters and transitional housing.

Facilities should be operated by organizations with experience and expertise in the field of caring for the homeless. It is recommended that at least one shelter specialize in assisting families with children. The role of the City should be to assist in finding a location, and to provide some start-up, maintenance and operations funding. It is not suggested that the City fund entire operations.

Agencies could then apply for and receive tentative funding approval for applicable projects. This funding would not represent the entire amount needed to start the shelter, but would provide seed money.

The service network to shelter the homeless in the Ventura area has included:

- 15 to 20 McKinney Act shelter vouchers distributed by the County Public Social Services Agency and the Salvation Army.

- 15 to 20 rental deposit loans made annually by the Commission on Human Concerns, assisted partially by a City grant.

- One travel trailer each at Eastminster Presbyterian Church, First Baptist Church, and Church of the Foothills to temporarily house the homeless.

- 12 to 20 beds of winter shelter provided by the Religious Coalition on the Homeless and the Commission on Human Concerns.

- 60 units at the Hamilton and Mission single-room occupancy hotels in Ventura.

- 180 beds at the Rose Avenue shelter in Oxnard operated by the Zoe Christian Center -- uncertainly exists over whether Zoe will be able to operate this facility on a continuing basis at this location.

The City has set aside $400,000 to assist in obtaining financing for permanent homeless shelter facilities. Based upon a selection process which reviewed numerous competing proposals, the City has entered into exclusive agreements to commit $200,000 each to two groups, Project Understanding and the Zoe Christian Center. These agreements are not site specific, but are contingent upon obtaining site approvals by June 30, 1990.

The Project Understanding facility is expected to provide a transitional shelter emphasizing service to families. The Zoe facility is anticipated to also serve shorter term needs.

This program addresses Objective 8 and Policy 8.1.

b. <u>Quantified Objectives</u>: To provide a permanent shelter(s) furnishing at least 50 beds for homeless families. It is anticipated such a facility would be developed and operated by a non-profit organization, with the City providing financial assistance. Local experience indicates that families would stay three to four months. Therefore, such a shelter could serve approximately 150 families per year.

c. Implementation:

1) Administrative Responsibility. Operational responsibility should be with an agency with experience and expertise in the field. However, one City staff person should be designated to act as liaison with private agencies, to coordinate locating a site, obtain approvals, and establish funding.

2) Funding. New funding would be required for this program. The City should consider setting aside money for both starting up the program and for its maintenance and operations. The City has thus far identified $400,000.

3) Schedule. Start-up funding set-aside should be used within a year. Some funding assistance should continue for five years after a shelter is opened.

10. Land Banking Assistance Program

a. Program Description: Funds from this program are lent to the Housing Authority at low or no interest, to enable it to purchase sites for housing projects. Once project funding is obtained from HUD, the loan is repaid and can then be used again for another project. At the present time, this program does not assist private developers of low-cost housing; however, if HUD ceases to provide funding to the Housing Authority for new housing projects, the City or its Redevelopment Agency should consider using the money for land write downs or other forms of assistance.

This program addresses Policies 2.1, 2.3, 9.1, 9.2 and 9.3.

b. Quantified Objectives: This program is implemented on a case-by-case basis as suitable land becomes available, making establishment of numerical objectives difficult.

c. Implementation:

1) Administrative Responsibility. The program is managed by the City through the administration of Land Banking Assistance Program funds.

2) Funding for this program was previously appropriated and is used on a revolving basis. No additional funding is identified at this time.

3) Schedule. This program is used on an as-needed basis.

11. Housing Needs Assessment Program

a. Program Description: The Housing Needs Assessment Program monitors housing needs information to reassess and update the City's data base. This program is carried out as part of the Community Development Report, prepared by the Planning Division. Information from this assessment is used to monitor progress towards meeting housing needs and to suggest new direction, if necessary.

In future Community Development Reports, the section should be expanded to monitor progress in achieving Housing Element program objectives. This program addresses Policy 12.1.

b. Quantified Objective: This program does not lend itself to quantified objectives.

c. Implementation:

1) Administrative Responsibility. Administrative responsibility for this Program is with the Department of Community Development.

2) Funding. No additional funding or staffing is anticipated.

3) Schedule. This is an ongoing program.

12. Technical Assistance Program

a. Program Description: The Technical Assistance Program represents a continuing effort to provide assistance for private developers seeking to build low and moderate income housing. This assistance includes:

- Information on current State and Federal housing programs;
- Information on tax incentives for low and moderate income housing;
- Assistance in filling out applications; and
- Assistance with State and Federal agency processing requirements.

This program addresses Housing Element Objectives 1 and 6, and Policies 1.1, 1.2, 1.3 and 12.3.

b. Quantified Objectives: It is anticipated at least 60 requests for housing technical assistance will be responded to over the 1989-1994 period.

c. Implementation:

1) Administrative Responsibility. This function will continue to be carried out primarily by the Department of Community Development.

2) Funding. No additional funding or staffing is anticipated.

3) Schedule. This is an ongoing program.

13. Redevelopment and Intensification

a. Program Description: The City had traditionally relied primarily upon development of vacant lands in expanding the housing supply. Redevelopment and intensification are of growing importance as vacant lands in the Planning Area become more limited.

The City's Redevelopment Agency has proposed amending the Downtown Redevelopment Area Plan to allocate additional sites for residential uses and increase the intensity of use allowed in some instances. This would allow for approximately 500 additional dwelling units in the Downtown Redevelopment Area.

The Land Use Element also calls for considering establishment of a new redevelopment area in some of the non-residential parts of the Montalvo Community. In addition, the Land Use Element redesignates portions of several blocks in the Avenue Community from General Industrial (M) to Transitional Residential, 15

dwelling units per net acre (TR-15). This will facilitate future residential conservation and intensification. This program addresses Housing Element Objectives 1, 2, and 6.

b. Quantified Objectives: The quantified objective for the Downtown Redevelopment Area Plan Amendment is to provide an additional 200 dwelling units over the next five years. Of these, at least 30 would be lower income units. The objective for the Montalvo area is to create a feasibility study within the five-year period after adoption of the updated Housing Element, although termination of recent efforts to annex portions of the Montalvo Community may delay this initiative indefinitely.

c. Implementation

1) Administrative Responsibility. The Community Revitalization Division staff in the Department of Community Development is responsible for providing staff support to the Redevelopment Agency for redevelopment projects.

2) Funding. Approximately $58,000 has been appropriated to pay for the Environmental Impact Report required to amend the Downtown Redevelopment Area Plan.

3) Schedule. The amendment to the Downtown Redevelopment Area Plan is to be accomplished over the next year. The Feasibility Study for a redevelopment area in Montalvo is to be completed over the next five years.

14. Redevelopment Tax Increment Funds

a. Program Description: State law requires 20% of tax increment funds received by redevelopment agencies to be devoted to providing low or moderate income housing. Because of the flexibility available in using such funds to assist other housing programs, and declining State and Federal funding, this source is assuming increasing importance. Three redevelopment areas exist in the City: the Beachfront Redevelopment Project Area, Mission Plaza Redevelopment Project Area, and Downtown Redevelopment Project Area.

The City has entered into an exclusive negotiating agreement with a private developer to provide 113 condominium units in the Downtown Redevelopment Area. It is the intent of this program to use tax increment funds to assist provision of low and moderate income units in conjunction with this project, or at another location in the Downtown Redevelopment Area. Funds should be expended within five years of their receipt.

Options for using the funds include acquisition of land and buildings, on or off-site improvements, rehabilitation of buildings, and provision of subsidies for financing housing. Funds may also be provided to the Housing Authority for these purposes.

This program has the potential to assist any of the Housing Element objectives and policies requiring additional funding.

b. Quantified Objectives: The objective of this program is to be able to set aside $100,000 per year to assist other housing program efforts.

c. Implementation:

1) Administrative Responsibility. This program is administered by the Revitalization Division in the Department of Community Development, as staff to the Redevelopment Agency.

2) Funding. As noted above, funding is secured through tax increment revenues, and an objective of $100,000 per year has been identified.

3) Schedule. This program is to be carried out on a continuing basis.

15. Mobile Home Conservation

a. Program Description: One of the City's most important affordable housing resources consists of existing mobile homes.

The City has enacted a rent stabilization program for rental mobile home parks. All eleven of the City's mobile home parks (but not the trailer parks) are covered. Parks may apply for an increase once each year. The formula for calculating rent increases is rather complex, but the average increase is around 5% per year. This is considerably below the rent increases typically experienced by apartment dwellers. The Rent Stabilization Ordinance has the effect of maintaining a pool of reasonably affordable residences, particularly for seniors, who are the majority of mobile home park residents.

The City's Zoning Ordinance contains a Mobile Home Park (MHP) zone that only allows a mobile home park, recreation facilities for residents of the park, and accessory uses. The purpose and intent of this zone

is to provide for mobile home parks which offer alternatives in the selection of residential units, and opportunities for affordable housing.

In addition, a Mobile Home Park (MHP) land use designation has been added to the Comprehensive Plan Land Use Element. It has been applied to mobile home parks where the underlying zoning has not been residential. This further enhances the conservation of affordable housing units in mobile home parks.

This program addresses Policy 6.1.

b. Quantified Objectives: The quantified objective for this program is to conserve the 1,835 mobile home units that exist in the Planning Area's mobile home parks.

c. Implementation:

1) Administrative Responsibility. The Rent Review Board is staffed by one person in the City Manager's Office on a part-time basis. The Planning Division in the Department of Community Development administers the Zoning Ordinance and Comprehensive Plan.

2) Funding. No additional funding or staff positions are anticipated to accomplish this objective.

3) Schedule. This conservation effort will be an ongoing function.

C. QUANTIFIED OBJECTIVES

Section 65583(b) of the Government Code calls for housing elements to include the community's goals, quantified objectives, and policies relative to the maintenance, improvement, and development of housing. The statute also recognizes that the total housing needs identified may exceed available resources and the community's ability to satisfy this need. Under these circumstances, the quantified objectives may differ from the identified needs, but should establish the maximum number of housing units that can be constructed, rehabilitated, and conserved over a five-year time frame.

Given the constraints identified in this Housing Element Technical Appendix, most notably the cost of land, air quality, and the availability of water, the RHNA targets for 1989-1994 cannot be fully met in the City of San Buenaventura. As a result, the City has set forth the following quantified objectives, consolidating information from the preceding section of this document.

CHART 11

QUANTIFIED FIVE-YEAR HOUSING OBJECTIVES (1989-1994)

	CONSTRUCTED (DU)	REHABILITATED (DU)	CONSERVED (DU)
VERY LOW	157	15	
LOW	160	45	1,835*
MODERATE	782	15	
HIGH	1,014	-	-
	2,113	75	1,835

*The 1,835 units to be conserved are distributed among very low, low and moderate categories, and are basically units in the City's mobile home parks which are required to be maintained.

In addition, 285 beds for the homeless should be conserved, and 50 new beds provided. (Of these, 180 beds are at the Zoe Christian Center in Oxnard.)

VIII. OTHER HOUSING PROGRAM COMPONENTS

This section describes how other requirements for the Housing Element are addressed, including:

- Equal Housing Opportunity;
- Citizen Participation;
- Comprehensive Plan Consistency;
- Energy Conservation; and
- Housing in the Coastal Zone.

A. EQUAL HOUSING OPPORTUNITY

Under City Council Resolution No. 75-98, all City housing programs are administered according to fair housing principles. The Fair Housing/Tenant-Landlord Relations Program (Housing Program No. 6) addresses this concern.

The Housing Incentives Program under the City's AQMP assists equal housing opportunities, because it encourages low income housing in newer, developing areas of the City, thus enabling affordable housing to be obtained outside older neighborhoods where minority groups have historically been concentrated.

B. CITIZEN PARTICIPATION

The updated Housing Element was developed as part of an overall Comprehensive Plan update spearheaded by the Comprehensive Plan Review Committee (CPRC), a broad based citizen group. Between mid-1986 and November 1987, CPRC conducted public meetings on an almost biweekly basis as part of the Comprehensive Plan update process. Several of these meetings focused upon the Housing Element.

The City Council Ad Hoc Committee on Affordable Housing, in conjunction with the Comprehensive Plan Update process, focused accelerated attention on programs needed to help address pressing affordable housing issues. The Committee solicited input from a broad spectrum of the community. Among the groups providing input to this effort were the City Housing Authority, Cabrillo Economic Development Corporation, Network for Housing, Ventura County Commission on Women, and Building Industry Association.

Public participation on a continuing basis will be facilitated by the ongoing operation of the Rent Review Board and the Housing Element's Technical Assistance Program.

C. COMPREHENSIVE PLAN CONSISTENCY

Section 66583(c) of the Government Code requires that the Housing Element describe the means by which consistency will be achieved with other general plan elements and community goals.

In order to help assure internal consistency in its Comprehensive Plan, the City updated all elements simultaneously. All elements were reviewed in tandem with one another to identify and correct any potential inconsistencies.

The population associated with build-out of vacant residential lands was calculated based upon land use designations contained in the updated Land Use Element to assure sufficient lands are made available to accommodate the population called for in the plan.

In addition, Capital Improvement Deficiency Studies are required in the Saticoy-Wells area, and in undeveloped Hillside areas on a community-wide basis to assure public facility needs are identified and addressed so they do not pose unforeseen constraints to development.

All individual projects proposed are reviewed by the City's Environmental Impact Report Committee for consistency with the Comprehensive Plan.

Finally, the Master EIR prepared on the City's Comprehensive Plan contained an analysis of internal consistency of the plan's various elements.

D. ENERGY CONSERVATION

The City advocates energy conservation through three separate methods. The first is the City's AQMP project evaluation criteria, which offer incentives for developers to incorporate energy conservation measures into their projects. These features could include active and passive solar water and space heating designs, double pane glass and drought tolerant landscaping.

The second approach involves modifications of the City Building and Zoning Codes that will allow energy efficiency in construction designs. As an example, setback requirements may be less stringent to permit efficient building siting for use of active or passive solar energy. The Residential Planned Development (RPD) zoning categories allow flexibility in setbacks, and provide for techniques such as clustering of development.

A third approach is through land use designations. Planned Residential (PR) designations encourage the flexibility described under the RPD zoning designation. The Planned Mixed Use Development (PMXD) designation allows a variety of uses in one area. Combining residential, office and commercial uses can reduce commuting distances between home and work or shopping. Day care, financial institutions and other personal services conveniently located adjacent to residential areas can also reduce trip generation and energy consumption by these house-

holds. This approach has the additional advantage of potentially reducing air pollution.

E. HOUSING IN THE COASTAL ZONE

Section 65588 of the Government Code requires that Housing Element updates contain additional information about housing in the coastal zone.

This includes:

- Number of new units approved for construction after January 1, 1982:	158
- Number of new units for low and moderate income households required to be provided either within the coastal zone or within three miles of it:	94
- Number of units occupied by low and moderate income households and authorized to be demolished or converted since January 1, 1982:	68
- Number of units for low and moderate income households required either within the coastal zone or within three miles of it in order to replace those being demolished or converted:	68

The total number of new units approved for construction is approximate.

Construction of the Mission Plaza Shopping Center at Ventura Avenue and Main Street required demolition of 68 dwelling units: 58 at the Plaza Hotel, 7 at the Lopez apartments, and 3 others.

These were replaced by the following units:

Developer	Location	Income	Number of Units
Weston	Telephone Road at Highway 101	Moderate	33
Wittenberg	Telephone Road at Utica	Low	15
Housing Authority/ Wittenberg	Jasper near Darling Road	Very Low	20
TOTAL			68

An additional 26 low to moderate income dwelling units are required as a result of other redevelopment requirements. This requirement was met through construction of the 48-unit Garden Estates project in the Downtown Redevelopment Project.

An important conservation measure in the City's coastal area is addition of a Mobile Home Park (MHP) land use designation in the Comprehensive Plan Land Use Element. This designation has been applied to the Ventura Marina Mobile Home Park in the Ventura Harbor area. Thus, in spite of the underlying Harbor-Commercial (HC) zoning, 310 mobile home dwelling units will be conserved.

The Comprehensive Plan designates an 8.1 acre site west of Sanjon Road, between the Southern Pacific Railroad and U.S. Highway 101, from Planned Commercial - Tourist Oriented to Planned Mixed Use Development, emphasizing affordable housing for seniors at a density of 20 dwelling units per acre.

Both of these new land use designations are subject to approval by the California Coastal Commission, however.

The Land Use Element also includes a policy to: "preserve and protect existing visitor-serving facilities, specifically lower cost motels..." in the coastal area.

EXHIBITS

EXHIBIT 1

HOUSING ELEMENT GUIDELINES

STATE DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

SECTION 65583

The housing element shall consist of an identification and analysis of existing and projected housing needs and a statement of goals, policies, quantified objectives, and scheduled programs for the preservation, improvement, and development of housing. The housing element shall identify adequate sites for housing, including rental housing, factory-built housing, and mobilehomes, and shall make adequate provision for the existing and projected needs of all economic segments of the community. The element shall contain all of the following:

(a) An assessment of housing needs and an inventory of resources and constraints relevant to the meeting of these needs. The assessment and inventory shall include the following:

(1) Analysis of population and employment trends and documentation of projections and a quantification of the locality's existing and projected housing needs for all income levels. These existing and projected needs shall include the locality's share of the regional housing need in accordance with Section 65584.

(2) Analysis and documentation of household characteristics, including level of payment compared to ability to pay, housing characteristics, including overcrowding, and housing stock condition.

(3) An inventory of land suitable for residential development, including vacant sites and sites having potential for redevelopment, and an analysis of the relationship of zoning and public facilities and services to these sites.

(4) Analysis of potential and actual governmental constraints upon the maintenance, improvement, or development of housing for all income levels, including land use controls, building codes and their enforcement, site improvements, fees and other exactions required of developers, and local processing and permit procedures.

(5) Analysis of potential and actual nongovernmental constraints upon the maintenance, improvement, or development of housing for all income levels, including the availability of financing, the price of land, and the cost of construction.

(6) Analysis of any special housing needs, such as those of the handicapped, elderly, large families, farmworkers, families with female heads of households, and families and persons in need of emergency housing.

(7) Analysis of opportunities for energy conservation with respect to residential development.

(b) A statement of the community's goals, quantified objectives, and policies relative to the maintenance, improvement, and development of housing.

It is recognized that the total housing needs identified pursuant to subdivision (a) may exceed available resources and the community's ability to satisfy this need within the content of the general plan requirements outlined in Article 5 (commencing with Section 65300). Under these circumstances, the quantified objectives need not be identical to the identified existing housing

needs, but should establish the maximum number of housing units that can be constructed, rehabilitated, and conserved over a five-year time frame.

(c) A program which sets forth a five-year schedule of actions the local government is undertaking or intends to undertake to implement the policies and achieve the goals and objectives of the housing element through the administration of land use and development controls, provision of regulatory concessions and incentives, and the utilization of appropriate federal and state financing and subsidy programs when available. In order to make adequate provision for the housing needs of all economic segments of the community, the program shall do the following:

(1) Identify adequate sites which will be made available through appropriate zoning and development standards and with public services and facilities needed to facilitate and encourage the development of a variety of types of housing for all income levels, including rental housing, factory-built housing, and mobilehomes, in order to meet the community's housing goals as identified in subdivision (b). The program may include an identification of adequate sites for emergency housing.

(2) Assist in the development of adequate housing to meet the needs of low- and moderate-income households.

(3) Address and, where appropriate and legally possible, remove governmental constraints to the maintenance, improvement, and development of housing.

(4) Conserve and improve the condition of the existing affordable stock.

(5) Promote housing opportunities for all persons regardless of race, religion, sex, marital status, ancestry, national origin, or color.

The program shall include an identification of the agencies and officials responsible for the implementation of the various actions and the means by which consistency will be achieved with other general plan elements and community goals. The local government shall make a diligent effort to achieve public participation of all economic segments of the community in the development of the housing element, and the program shall describe this effort.

EXHIBIT 2

STATE DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

COMMENTS ON CITY OF SAN BUENAVENTURA DRAFT HOUSING ELEMENT

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

Division of Housing Policy
Development
921 Tenth Street
Sacramento, CA 95814
(916) 323-3176

March 23, 1987

Mr. John Baker
City Manager
City of San Buenaventura
P.O. Box 99
San Buenaventura, CA 93003-0099

Dear Mr. Baker:

RE: Review of San Buenaventura's Draft Housing Element

Thank you for submitting San Buenaventura's draft housing element, received February 9, 1987, for our review. As you know, we are required to review draft housing elements and report our findings to the locality (Government Code Section 65585(b)).

Our review has been facilitated by a phone conversation on March 17, 1987 with Debby Millais of your staff. This letter and appendix summarize the conclusions of that discussion.

San Buenaventura's housing element thoroughly documents the City's housing needs and clearly describes a comprehensive program to address those needs. In our opinion, however, certain changes are needed to comply with State housing element law. Suggested changes and other comments appear in Appendix A to this letter.

We hope our comments are helpful to the City and we wish you success in the implementation of your housing program. We appreciate the time and effort of Ms. Millais during our review. In accordance with requests pursuant to the Public Information Act, we are forwarding copies of this letter to the persons and organizations listed below. If you have any questions about our comments or would like assistance in the implementation of your housing program, please contact Steve Boilard of our staff at (916) 323-4475.

Sincerely,

Nancy J. McKee

Nancy J. McKee, Chief
Division of Housing Policy
Development

NJM:SB:bt

cc: Debby Millais, Senior Planner, City of San Buenaventura
Jonathan Lehrer-Graiwer, Western Center on Law and Poverty, Inc.
Louise Rice-Lawson, Santa Barbara-Ventura Counties Region
Clint Rosemond, Southern California Association of Governments
Bob Cervantes, Governor's Office of Planning and Research
Tom Bannon, California Building Industry Association

APPENDIX A

City of San Buenaventura

The following changes would, in our opinion, bring San Buenaventura's housing element into compliance with Article 10.6 of the Government Code. Following each recommended change we cite the supporting section of the Government Code. Where particular program examples or data sources are listed, these are suggestions for your information only. We recognize that San Buenaventura may choose other means of complying with the law.

1. Include an analysis of the City's share of the regional housing need as defined by SCAG (Section 65583(a)(1)). The element includes an analysis of future needs based on current SCAG data, and in this respect will be valid until July 1, 1989. However, for this element to be valid past the July 1, 1989 update requirement, it should use new projections from SCAG's 1989-1994 Regional Housing Allocation Model (RHAM), expected to be produced by July 1, 1988.

2. Include an inventory of sites which will be made available through appropriate zoning and development standards to encourage the development of sufficient capacity and variety of housing types to meet the City's needs for all income levels (Section 65583(c)). Table V-1 of the element approaches this requirement, but does not break out sites by different zoning levels. Such data is necessary, in our opinion, to determine whether an adequate supply of higher density and manufactured housing can be accommodated. Additionally, if this element is to satisfy the July 1, 1989 update, the sites inventory should accommodate the new SCAG projections.

3. Describe the City's efforts to achieve participation of all economic segments of the community in the development of the housing element (Section 65583(c)). In our opinion, the discussion on the second page of Section X of the element should be expanded to describe all the public opportunities to participate in housing element development.

4. Coastal Zone Requirements - For those portions of unincorporated Los Angeles County contained within the coastal zone, include the following information:

   - Number of new units approved for construction after January 1, 1982 (Section 65588(d)(1)).

   - Number of units for low- and moderate-income households required to be provided either within the coastal zone or within three miles of it (Section 65588(d)(2)).

   - Number of units occupied by low- and moderate-income households and authorized to be demolished or converted since January 1, 1982 (Section 65588(d)(3)).

- o Number of units for low- and moderate-income households required either within the coastal zone or within three miles in order to replace those being demolished or converted (Section 65588(d)(4)).

5. Since this is an update of the City's 1981 housing element, this element should incorporate a review and revision of the previous element (Section 65588(a) and (b)). Appendix B to this letter outlines these requirements.

6. The element's analysis of the City's Air Quality Management Program (AQMP) raises the question of whether the City's share of the regional housing need can be achieved. We recommend that the City analyze the AQMP in the light of the new SCAG figures when they become available. Appendix C to this letter provides more information on growth control ordinances vis-a-vis housing elements.

EXHIBIT 3

CITY OF SAN BUENAVENTURA
AFFORDABLE HOUSING PROGRAM

CITY OF SAN BUENAVENTURA

AFFORDABLE HOUSING PROGRAM

I. INTRODUCTION

A. Purpose and Intent

There is currently within the City of San Buenaventura a need for housing affordable to low and moderate income households, both renters and homebuyers. High and rising construction costs and interest rates have made it difficult for such households to purchase or rent a home. The City recognizes its authority and responsibility, set forth in Sections 65302(c), 65580(d) and 65583(c)(2) of the Government Code, to develop programs to meet such housing needs. For these reasons, the City Council finds and declares it necessary to assist in providing ownership and rental housing for low and moderate income households, and to ensure that such housing remains in the affordable market.

In order to encourage provision of such housing, three types of incentives are provided: Affordable Housing points through the Air Quality Management Program, and density bonuses or equivalent incentives, and Development Agreements for 100% affordable housing. There are provisions for ownership and for rental housing. To be eligible for these incentives, developers of affordable ownership housing must comply with the terms and conditions of the Affordable Ownership Housing program; developers of rental housing must comply with the terms of the Affordable Rental Housing Program. Affording housing points are described in the Air Quality Management Program. The criteria for these programs are set forth herein.

B. Relationship to Existing Plans and Program

These programs are directly related to the existing programs; the Housing Element of the Comprehensive Plan and the Air Quality Management Plan Implementation Program.

1. Housing Element

   a. The Housing Element calls for adoption of an Affordable Ownership Housing Program which includes the following:

      (1) A mechanism for selecting and qualifying eligible households based on income limits.

      (2) A mechanism for determining sale prices

b. Under the Housing Incentives Program, the Housing Element calls for the preparation of a program adapting the Density Bonus Program to the City's needs.

2. Air Quality Management Plan (AQMP) Implementation Program

The AQMP Program limits the number of residential units which can be constructed each year, and allocates the permitted units among developers based on a point system. Affordable Housing points are available for provision of low and moderate income housing, either rental or ownership.

Low and moderate income units developed through the Density Bonus Program will not be eligible for AQMP Affordable Housing points because another incentive, the density bonus, has been given.

Affordable ownership units made available through either incentive program may be administered through the Affordable Ownership Housing Program, or through a Mortgage Revenue Bond Program, if one is available.

Affordable rental units made available through the Density Bonus program may be administered through the Affordable Rental Housing Program, or through a standard HUD-regulated rental housing program such as Conventional Housing.

C. Program Descriptions

1. The Affordable Ownership Housing Program includes the following:

   a. The Requirements for Participation, which describes the minimum qualifications that units and projects must meet in order to participate in the program;

   b. The Division of Responsibilities, which sets out what the specific responsibilities of the various program participants (developer, homebuyer, City) are;

   c. The Standards for Household Eligibility and Unit Prices, which list the criteria for determining household eligibility and describe the formula used for deciding unit prices; and

2. The Affordable Rental Housing Program includes the following:

   a. The Requirements for Participation, which describe the requirements and qualifications that units and projects must meet in order to participate in the program;

b. Division of Responsibilities, which outlines the specific responsibilities of the three parties involved; the developer, the Housing Authority, and the City; and

c. Standards for Household Eligibility and Rental Rates, which describes the criteria for determining household eligibility, and the formula for setting rental rates.

II. AFFORDABLE OWNERSHIP HOUSING PROGRAM

A. Requirements for Participation

In order for a development to participate in the program and to be eligible for AQMP Affordable Housing points or density bonus incentives, the following requirements must be met:

1. Price/Offer of Units for Sale

   Affordable units must be made available to qualified households at the price(s) determined through this program until all such units are sold.

2. Minimum Number of Units

   A minimum of four affordable units per development is required for incentives. The exact number of affordable units required for a given development shall be determined through incentive programs. Provision of the required number of affordable units will be made a condition of planning approvals.

3. Compatibility

   Affordable units developed in conjunction with and located within a market rate development, and which are of similar design, shall be of similar quality as the market rate units. Exteriors and floor plans of affordable units shall be similar to the market rate units; interior features such as luxury flooring, appliances, etc., need not be the same.

4. Location

   Affordable units which are developed as part of a larger market rate development and which are similar to market-rate units shall be dispersed throughout the development rather than clustered in a single area or a few areas. Siting of the affordable units within a project shall be approved by the City Planner in order to ensure dispersal.

B. Division of Responsibilities

Three parties will be involved in the program; the developer, the home buyer, and the City. Program responsibilities will be divided as follows:

1. Developer

The project developer will:

(a) Offer the required number of affordable units for sale and sell only to persons qualified to purchase in accordance with the terms and provisions of this Resolution;

(b) Consult with the City and/or its designee to determine the price ranges at which the developer will be required to offer the units for sale;

(c) Notify the City and/or its designee of issuance of the Department of Real Estate Public Report, upon receipt of same by the developer;

(d) Notify the City and/or its designee, ten (10) days in advance, of the date on which affordable units will become available for sale, and submit monthly reports to the City covering the progress of sales of affordable units; and

(e) Advertise the units, ensure that sales people are available to show them and provide assistance in sales processing and paperwork for the affordable units in the same manner as the market rate units; and

(f) Pay to the City and/or its designee a fee, based on a rate of $20.00 per hour adjusted from 1988 to reflect current cost-of-living increases, or such other current hourly rate as is charged by the City or its designee, to compensate for time expended qualifying applicants and preparing the list of eligible households.

In addition, the developer, with the assistance of the City or other such applicable agency, should make every effort to obtain below market interest rate financing for the affordable units.

(g) Resale Controls:

Record a City-approved resale control deed restriction, covenant, or other servitude upon each affordable project, unit and lot. The resale control shall prohibit and make void any attempt to convey the project, unit, and lot, or to transfer any right to occupy or use the project, unit, and lot for any consideration in an amount or of a kind in excess of the affordable price as defined below. The affordable price will be defined by the City Council and adjusted from time to time for increases or decreases in the Ventura

County median income as determined and published annually by the United States Department of Housing and Urban Development, or the affordable price may be adjusted by a similar index if the HUD median income determination ever becomes unavailable. The resale control shall be effective for a period of not less than fifteen (15) years from the date of the initial sale, or for such longer time as may be required in conjunction with any specific project. All resale controls will be imposed by deed restrictions, covenants, or other servitude which shall run with the land and shall be enforceable by the City or its designee against any buyer or seller for the term of the control. In addition, the City may require the project developer to grant a right of first refusal at the affordable price to the City or its designee, or it may require other resale control methods. The City may allow increases in the affordable price to reflect reasonable capital improvements by the owner when the improvements are of a nature and kind that would be added to the owner/purchaser's basis in the project, unit and lot under applicable Federal tax laws and regulations for residential real property which is the owner's primary residence. The City may also allow increases in the affordable price to reflect the customary and reasonable costs of real property transfer which have been actually and necessarily incurred by the owner, including reasonable brokerage commissions.

2. Home Buyer

The prospective purchaser of an affordable unit will:

(a) Provide the information necessary to determine whether the household is qualified to participate in the Program;

(b) Complete the loan application and supply the information necessary to process the loan;

(c) Provide the minimum down payment required;

(d) Comply with all deed conditions, restrictions, and/or requirements of this program; and

(e) Occupy the unit for a minimum of two years. The homebuyer is required to live in the unit at all times. The purchaser may not lease, rent or sell the unit during that time, except as consented to by the City and/or its designee. The City will not accept leases for over one year. After one year of rental, a unit must be sold pursuant to the affordable housing deed restriction.

3. City of San Buenaventura or its designee will:

(a) Evaluate proposed affordable housing projects to determine whether they are in accordance with the terms and provisions of this Resolution;

(b) Assign bonus points as may be appropriate under the AQMP program and/or administer other incentive programs approved by the City;

(c) In consultation with the developer, determine price ranges for the affordable units;

(d) Set and periodically update the requirements and qualifications for eligible households; and

(e) Review records submitted by developer and applicant households to identify eligible households.

C. Standards for Household Eligibility and Unit Prices

1. Criteria for Household Eligibility

Households shall be eligible to purchase an affordable unit if they meet the following criteria:

(a) Household income standards shall be based on 110% of the Ventura County area median income as described by the United States Department of Housing and Urban Development income index, adjusted for household size, or other equivalent Federal data.

(b) For the purpose of the Density Bonus Program, household income shall not exceed:

(1) 120% of the median income, if 25% of the total units are affordable.

(2) 80% of the median income, if 10% of the total units are affordable.

(c) For Development Agreements for affordable housing, household income shall not exceed 110% of median income for ownership housing or 80% of median income if rental housing. The City Council may authorize households of moderate income to purchase units if such units have not sold initially within what the City Council determines to be a reasonable time, but home sale prices shall not be increased for this purpose.

(d) Household assets shall not exceed the total of:

(1) The required minimum down payment and closing costs, plus

(2) The amount needed to pay monthly housing costs for six months, plus

(3) An amount equal to 10% of the currently applicable sales price of the affordable unit.

2. Determination of Initial Affordable Unit Sales Price

Initial prices shall be calculated so that, after a 10% down payment, gross monthly housing expense shall not exceed 30% of the gross monthly income of an eligible household as defined in Section C-1. For the purposes of this program, gross monthly housing expense shall include an amount for utilities, insurance, property taxes, and other non-mortgage housing expenses (see Appendices A and B). For Fiscal Year 1988-89, this amount is $150.00 and may be adjusted by the City from time to time based on City surveys of actual costs.

Developers may meet the price standards by lowering either the interest rate or the unit prices. If an adjustable rate mortgage is offered, the effective interest rate over a 30 year loan term must equal the rate shown in the interest rate column of Appendix A.

D. Definitions

1. Assets. For the purpose of this Resolution, "Household Assets" means the value of a household's savings and equity in stocks, bonds, real property, or other forms of capital investment. "Assets" does not include items reasonably necessary for the personal use of the household, such as personal effects, furniture, appliances, automobiles, and real or personal property used in a business or undertaking which is a primary source of livelihood for such household.

III. AFFORDABLE RENTAL HOUSING PROGRAM

A. Requirements for Participation

In order for a development to participate in this Program whether for a Density Bonus or for AQMP Affordable Housing points, the following requirements must be met:

1. Low/Moderate Income Units.

To be eligible for density bonus incentives, the project must contribute at least 25% of the total units for low and moderate income households, as defined in Section 50093 of the Health and Safety Code, or 10% of the total units for

lower income households as defined in Section 50079.5 of the Health and Safety Code.

2. Time Period

The units must be made available to such households for a minimum of thirty (30) years.

3. Rental Rates

Rental units shall be made available at rents not to exceed those described in Section C-2 below.

4. Compatibility

Affordable rental units developed in conjunction with a market rate rental development shall be of similar design and similar quality as the market rate units. Exteriors and floor plans of affordable units shall be similar to the market rate units; interior features such as luxury flooring, appliances, etc., need not be the same.

5. Location

Affordable rental units in a rental development shall be dispersed throughout the development rather than clustered in a single area or a few areas. Siting of the affordable units within a project shall be approved by the City Planner in order to ensure dispersal.

B. Division of Responsibilities

Program responsibilities will be divided as follows:

1. Developer

The project developer will:

(a) Provide the requisite number of units, renting at the prices and rates set forth below. Specific units shall be designated for participation in the program

(b) Enter into a lease or other agreement or arrangement with the Housing Authority or the City for the period specified herein, to the satisfaction of the City Planner and City Attorney.

(c) Execute and record a deed restriction or other document in a form and manner acceptable to the City Planner and City Attorney, to make or record the limitations and requirements set forth in the Affordable Rental Housing Program.

(d) Pay to the Housing Authority or to the City if the City is administering the Program, a fee, based on the rate of $20.00 per hour adjusted from 1988 to reflect current increases in the Federally reported Consumer All-Items Price Index, or such other current rate as is charged by the administering agency, to compensate for time expended establishing rental rates and determining eligibility of low or moderate income families.

(e) Provide for management of all the units. It shall be the responsibility of the management to notify the Housing Authority, the City, or any designee thereof, depending upon which entity is administering the contract, when a participating unit is vacant.

2. Housing Authority

The Housing Authority will:

(a) Administer any lease or other agreement executed in accordance with Section III-C-3, except where the Agreement is being administered by the City.

(b) Provide, to the extent feasible, eligible low income tenants.

(c) Administer any lease or other agreement executed in accordance with Section III-C-3, except where the Agreement is being administered by the Housing Authority.

3. City

The City will:

(a) Provide the density bonus or other incentive.

(b) Consult with the Housing Authority in setting rental rates, as described in Section C-2 below.

C. Standards for Household Eligibility and Rental Rates

1. Household Eligibility. Households shall be eligible to rent a unit made available through this Program if household income does not exceed 80% or less of median income. Federal Section 8 or voucher rent supplements may be used by eligible households if available.

2. Rental Rates.

Rental units under this Program shall be rented by the owner at a rental rate not to exceed the lesser of (a) HUD Fair Market Rents (FMRs) in force at the time of rental, and as they may be updated from time to time or (b) an

amount which is affordable for households of 80% or less of median income which pay 30% of income for rent. The term "rent" as used herein includes water, gas, electric, and rubbish collection utility costs, and such costs may not be charged to tenants over and beyond the rent.

3. Units under this Program will be leased or rented for a period of thirty (30) years pursuant to an agreement or other arrangement with the Housing Authority or City to the satisfaction of the City. The purpose of the agreement or arrangement will be to provide for rental of such units during a continuous period of at least thirty (30) years to persons or families of low income (per Health and Safety Code Section 50079.5 or 50093) who have been approved and referred by the Housing Authority or City.

The lease or other agreement with the Housing Authority or City may provide that in the event the Housing Authority should at any time not have eligible persons to occupy a unit or need to suspend or cease the program temporarily or otherwise, the Housing Authority or City may elect to release the unit temporarily to the owner for rental by the owner on a month-to- month basis at market rates until such time as the Housing Authority or City gives notice of its desire to recommence utilization of the unit. Upon such election by the Housing Authority or City, the Housing Authority or City shall have no obligation to pay rent until the unit is reclaimed and reoccupied on behalf of the Housing Authority or City. Upon the giving of notice by the Housing Authority or City determined of its desire to recommence use of the unit, owner shall promptly give sixty (60) days notice to the then occupant to vacate, and take all other appropriate steps to return the unit for occupancy by a Housing Authority eligible person or family.

D. Amendments

The provisions hereof are subject to amendment and modification and shall apply as amended or modified to all projects that are under this Program, to the extent feasible.

IV. DEVELOPMENT AGREEMENTS FOR 100% AFFORDABLE HOUSING PROJECTS

A housing developer may choose to request a Development Agreement to produce 100% affordable housing.

A. In order to qualify for a Development Agreement, a project must meet the following criteria:

1. Developer must agree to abide by a Development Agreement which allocates all (100%) of the housing units for ownership housing to persons who earn no more than 110% of the median income; or in the case of rental projects, no more than 80% of the median income.

2. For ownership, Developer must meet the requirements of Section II-B-1(g) above, except that the terms shall be for no less than 20 years.

   For rental projects, the Developer must comply with the requirements relating to the Affordable Rental Housing Program dwelling units available for a period of no less than 30 years to qualified persons.

3. If units are to be sold to home purchasers, developer must agree to make every reasonable effort to provide a package of financial enhancement to each unit, which would give a buyer an option to obtain below market financing, to the satisfaction of the City Council.

4. Developer must submit to the City an affirmative marketing program, which would be designed to encourage participation in sales or rental by local persons living or working in the local area. The developer must agree to not discriminate against any housing occupant on the basis of race, gender, color, religion, creed, marital status, ancestry or national origin.

5. The maximum allocation of housing units allowed pursuant to any Development Agreement in any one year shall not exceed 100 units and the phasing of the proposed project must reflect this limit.

B. Any application for a Development Agreement to produce 100% affordable housing must be accompanied by:

   1. A complete Development Agreement application form together with all plans and fees.

   2. Complete applications, together with the plans and fees required for each, for all discretionary permits which may be necessary for the project to be built, except Architectural Review Board applications, including, but not limited to, applications for environmental review, Comprehensive Plan Amendment, Annexation, Change of Zone, Tentative Subdivision Map, Planned Development Permit, etc.

   3. A letter committing to meet the qualifying criteria noted above.

C. Within sixty (60) days of the acceptance by the Planning Division of a Development Agreement application to produce 100% affordable housing and all related applications for necessary discretionary permits, the Director of Community Development will present the requests to the City Council for a prescreening determination. The City Council may either authorize the further processing of the applications or reject the applications. The effect of rejection would be return of plans and fees to the

applicant and a one-year restriction on reapplication. Among the criteria the City Council may use in evaluating such pre-screening requests are:

1. If over concentration of low to moderate income housing in a given area might result from approving the project requests.

2. Location of the site in a sensitive area such as flood plain, steep slope, or limited access areas or other environmental criteria.

3. Relationship of the total project population needed to the Air Quality Management Program allocations available in future years.

4. Consideration of the type of dwelling units proposed and their location on the site.

5. Extent to which the requests meet or exceed the criteria stated above for Development Agreements for 100% affordable housing, including type of financing; and type of cost controls.

If the City Council authorizes the further processing of applications, then all applications will be processed concurrently. If the City Council rejects the applications, then all applications, plans and fees other than fees already incurred in processing will be returned to the applicant and no similar application for a 100% affordable housing project may be filed for the same property within a one year time period.

D No Development Agreement for a 100% affordable housing project will be finally approved and signed until and unless:

1. The project is fully consistent with the Comprehensive Plan.

2. All necessary discretionary approvals for the project are received, including approval by the Architectural Review Board and approval for annexation by the Local Agency Formation Commission (LAFCO), if required.

3. There is a specific finding as a part of the Development Agreement approval that sufficient population for the project is available under the adopted Air Quality Management Plan.

4. All Development Agreements must as a minimum meet the criteria of these guidelines, as set forth above.

DV/kjr/8-110

SALES PRICE FOR AFFORDABLE AND DENSITY BONUS UNITS

Explanation: These charts compare affordability for ownership housing at two levels of affordability: 110% of median income for affordable housing points and development agreements; and 120% of median income for density bonus and related incentives. The affordable maximum prices are shown at various fixed-rate loan levels, based on the assumptions provided by the City report. The number of bedrooms in each unit is shown. These prices may be increased by the City at the time of initial sale to reflect increases in the median income as reported by the U.S. Department of Housing and Urban Development since March, 1989 for the Oxnard/Ventura metropolitan area.

AFFORDABLE HOUSING PROGRAM DEVELOPER AGREEMENT
110% OF MEDIAN INCOME

Lending Rate	Bedrooms 1	2	3	4
9%	$109,800	$124,300	$142,100	$168,700
10%	102,100	115,900	129,900	156,500
11%	92,100	107,700	119,900	143,200
12%	86,600	98,800	112,100	132,100
13%	81,000	91,500	103,200	124,300
14%	74,900	85,500	97,700	115,400

DENSITY BONUS PROGRAM
120% OF MEDIAN INCOME

Lending Rate	1	2	3	4
9%	$124,300	$142,000	$156,500	$185,300
10%	113,200	128,800	142,100	172,000
11%	104,300	119,900	129,900	158,700
12%	95,400	110,400	122,100	147,600
13%	89,000	103,200	113,200	136,500
14%	83,300	96,600	106,500	127,600

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APPENDIX B

CALCULATION OF UNIT PRICES

Initial unit sale prices shall be calculated based on the following per person household and maximum monthly expense standards:

Chart 1

Number of Bedrooms	Persons Per Households
1	2
2	3
3	4
4	6

This table is for the purposes of calculating maximum unit price only. It shall not be construed to preclude households of any size from purchasing a unit with a different number of bedrooms than shown on this table.

Deductions for utilities, taxes and related expenses are estimated and may change over time. For Fiscal Year 1989-90, this amount is $160, based upon City surveys.

Chart 2

Household Size	Income (110%)	Expense		
1	$33,500	$ 840	160 =	$ 680
2	38,400	960	160 =	800
3	43,100	1080	160 =	920
4	47,500	1190	160 =	1030
5	51,800	1300	160 =	1140
6	55,700	1390	160 =	1230

Household Size	Income (120%)	Expense		
1	$36,600	915	160 =	$ 755
2	41,900	1050	160 =	890
3	47,000	1180	160 =	1020
4	51,800	1290	160 =	1130
5	56,500	1410	160 =	1250
6	60,700	1520	160 =	1360

Using the above charts and a payment book which lists monthly amortizing loan payments for different interest rates, it is possible to calculate the maximum size of loan affordable for each household size. To arrive at the total maximum price for a unit, add a 10% down payment to the maximum loan size calculated previously. All incomes are based on the March 1989 levels reported by the U.S. Department of Housing and Urban Development for the Oxnard/Ventura metropolitan area.

Safety Element
TECHNICAL APPENDIX

City of San Buenaventura

SAFETY ELEMENT

TECHNICAL APPENDIX

CITY OF SAN BUENAVENTURA

August 1989

SAFETY ELEMENT
TECHNICAL APPENDIX

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INTRODUCTION

The Safety Element Technical Appendix is part of the City's Comprehensive Plan. It consists of an evaluation of the various hazards that might affect planning in the City's Planning Area, a discussion of standards and objectives relating to acceptable levels of risk in critical facilities, and a review of programs that are applicable to assist in mitigating the hazards identified. The Safety Element Technical Appendix also includes a number of figures which provide generalized maps and other information relating to hazards. The Safety Element Technical Appendix is the basis for the goals, objectives, policies and programs contained in the Safety Element.

I. HAZARD EVALUATION

This section identifies and evaluates the potential public safety risks in the City's Planning Area.

A. GEOLOGIC/SEISMIC HAZARDS

Ventura is located in a seismically active region. In addition to local faults, the City is in proximity to several major fault systems, including the San Andreas Fault. Earthquakes on these faults can include a variety of seismic hazards that can expose the public to significant risk. The potential for seismically induced hazards in the Planning Area is defined below:

1. Surface Rupture

a. General description: The earth is laced with faults - planes or surfaces in the earth where failure has occurred and materials on opposite sides have moved relative to one another because of stress. As most of these faults have not moved for hundreds of thousands or even millions of years, they can be considered inactive. Others, however, show evidence of recent activity or recently have moved sufficiently to be considered active. A classification system devised by the California Division of Mines and Geology to describe recent fault activity and the potential for future fault movement is described below:

- Historically active. Faults on which earthquakes have occurred during historic time (200 years) are classified as historically active.

It is often difficult to pinpoint the exact fault responsible for an earthquake. Epicenters are not always well located and fault patterns are often complex, because many moderate-size earthquakes do not cause ground surface fault rupture.

- Active. Faults that show evidence of displacement during the most recent epoch of geologic time, the Holocene, are classified as active. The Holocene epoch is usually considered to have begun 11,000 years ago. Any topographic expression of movement along a fault is considered evidence that the fault is active, because evidence of older surface rupture is often erased by erosion and deposition. (See: Geologic Time Scale, Appendix B.)

- Potentially active. Faults which displace deposits of Pleistocene Age, but show no evidence of movement in the Holocene period, can be considered to be potentially active. Pleistocene time is generally held to be the last 2 million years.

- Inactive. Faults that displace rocks of early Pleistocene age or older and show no more evidence of recent movement are classified as inactive.

Faults that are known to have moved in recent history, or that have exhibited signs of activity during the last 11,000 years, represent the greatest risk of future movement, because the dynamic forces that

caused the fault to move are more likely to still exert stress on that fault. Faults that have not exhibited signs of movement in the last 11,000 years are still capable of rapid movement, although it is likely that the stress-creating factors that caused past movement have subsided. Therefore, from a land use planning perspective, historically active and active faults represent the greatest risk to life and property.

Ground surface displacement along a fault, although more limited in area than the ground shaking associated with it, can have disastrous consequences when structures are located straddling the fault or near the fault zone. Fault displacement involves forces so great that it is not practically feasible (structurally or economically) to design and build structures to accommodate rapid displacement and remain intact. Amounts of movement during a single earthquake can range from several inches to tens of feet.

Another aspect of fault displacement is not the result of violent movement associated with earthquakes, but the barely perceptible movement along a fault called "fault creep." Damage by fault creep is usually expressed by the rupture or bending of buildings, fences, railroads, streets, pipelines, curbs, and other such linear features. Whether by rapid movement or slow creep, cumulative amounts of displacement along a fault can be quite significant. In the last 40 million years, the San Andreas Fault in Southern California has moved approximately 130 to 180 miles.

b. Effects of surface rupture: Permanent effects of ground displacement include the abrupt elevation changes (up or down) of the ground surface elevation along the fault, alteration of surface drainage patterns, changes in groundwater levels in wells, dislocations of street alignments and property lines, and a permanent change in grade of sewer and water utilities.

Secondary effects of ground displacement could include the disruption of traffic and emergency vehicles due to road and bridge destruction, flooding due to the disruption of surface drainage, and the disruption of vital utilities and community services.

c. Inventory of local faults: Figure 1 depicts the general location of local faults in the Planning Area. Where the location of the fault is not precisely known, it is shown as conjectured. This map is meant for general planning purposes only, and is not meant to substitute for detailed geotechnical evaluation necessary to precisely define a fault on a parcel-by-parcel basis.

- Ventura-Foothill fault. The Ventura-Foothill fault is an eastwest-trending fault that crosses the northern section of the City near the base of the adjacent foothills (Figure 1). The fault is north-dipping with reverse movement (north side is upthrown) that has been mapped largely from aerial photographs (Sarna-Wojcicki and others, 1976). Movement of the fault has apparently formed a scarp in Holocene-age sediments. In 1978, an "Alquist-Priolo" Special Studies Zone"

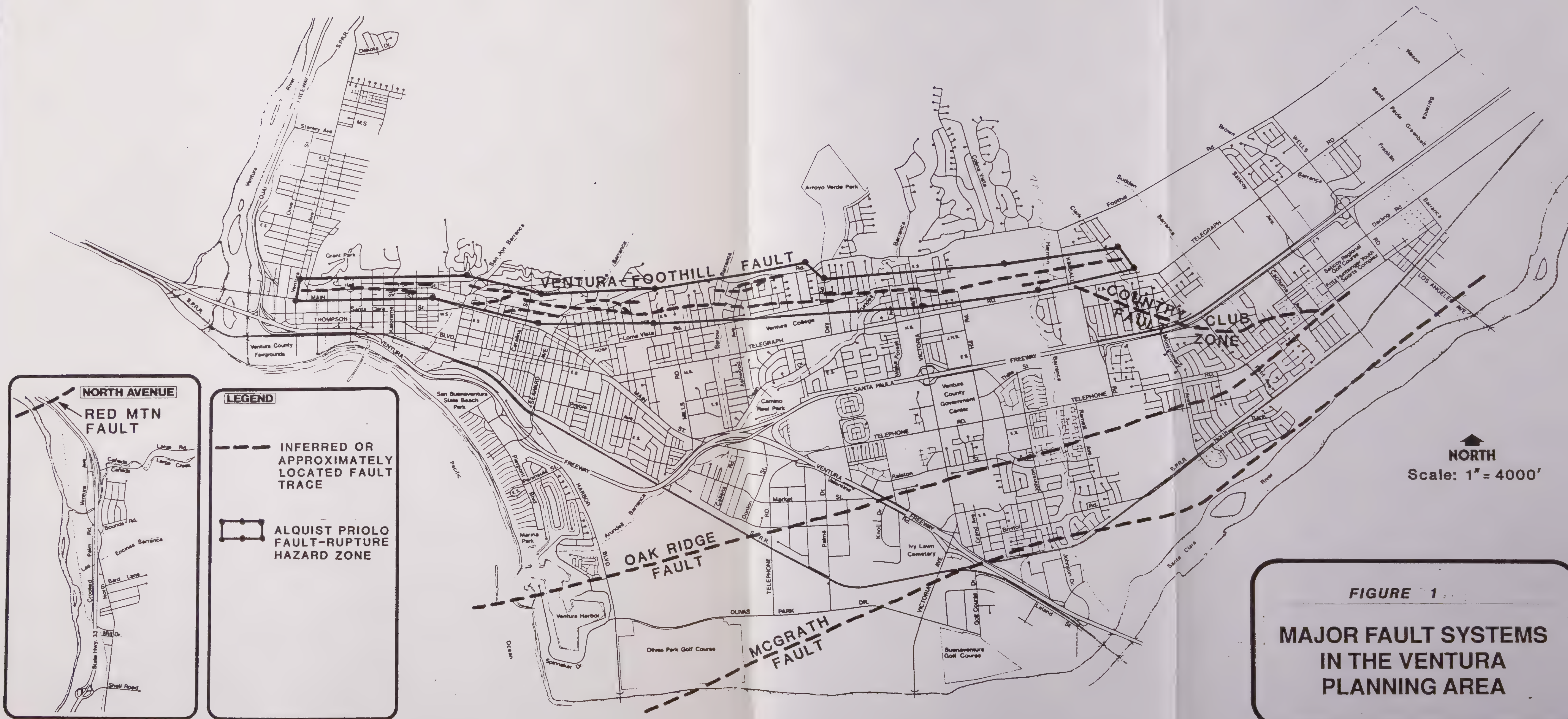


FIGURE 1

MAJOR FAULT SYSTEMS IN THE VENTURA PLANNING AREA

SOURCE: CDMG PRELIMINARY REPORT 14/CDMG SPECIAL REPORT 42

was imposed on the Ventura-Foothill fault by the State Geologist.

- Oak Ridge fault. The Oak Ridge fault is a northeast-southwest-trending fault extending across the southern and eastern portions of the City (Figure 1). The fault has thousands of feet of subsurface displacement, but is poorly defined at the surface. Pleistocene sediments are apparently displaced in the subsurface; however, late Pleistocene and younger sediments are apparently not faulted (Hart, Smith, and Smith, 1978).

- Country Club fault. The Country Club fault is a northwest-southeast-trending fault segment in the eastern portion of the City. The fault probably forms a groundwater barrier in late Pleistocene alluvium (Hart, Bortugno, and Smith, 1977) indicating late Pleistocene movement; however, there is no evidence of more recent movement. In 1976 the Country Club fault was evaluated and not recommended as an Alquist-Priolo Special Studies Zone.

- McGrath fault. The McGrath fault has been mapped as a southern branch of the Oak Ridge fault (Weber and others, 1973; Figure 1). Similar to the Oak Ridge fault, there is little evidence of the fault at the ground surface and no apparent evidence of displacement of late Pleistocene or younger sediments.

- <u>Red Mountain Fault</u>. Another fault that has the potential to result in significant amounts of ground shaking is the Red Mountain fault, located north of and adjacent to the City's water filtration plant on North Ventura Avenue. The Red Mountain fault is considered to be an active fault and portions of it have been included in Alquist-Priolo Fault-Rupture Hazard Zones.

- <u>Other faults</u>. In addition to the above named faults, there is a conjectured unnamed fault located near the Montalvo Mound, east of Victoria Avenue. The location of this fault is conjecture at this time and is the subject of ongoing study. Other features have been identified throughout the City that exhibit some of the typical characteristics associated with faults, such as long, linear features that are often identified only after careful study of aerial photographs. Some of these features could possibly be faults; however, insufficient study has been conducted to verify if these features are actually faults. The <u>Impacts of Hillside Development Environmental Impact Report</u> (1977) mapped some of these linear features, and should be consulted for their locations. (See also Figure 2)

d. <u>Local risk of surface rupture</u>: Areas in or near the City with the greatest potential to experience future ground displacement as a result of a fault rupture are those properties located within or along the trace of the Ventura-Foothill Fault. This area includes much of the Downtown area north of Main Street and residential areas between Telegraph and Foothill Roads (see Figure 1). Also located within

this fault zone are several critical structures and facilities.

The term "critical facilities" refers to structures or services that are vital to the City's ability to respond to a major disaster and to minimize loss of life and property. These types of facilities include police and fire stations, hospitals, bridges, electrical, water, and communication facilities. Other types of critical structures are those types of buildings that are used for public assembly, such as schools, auditoriums, shopping centers, etc. Critical facilities located in the Ventura Foothill fault hazard area include City Hall and portions of the Ventura County Medical Center. Structures located in the fault hazard zone that would have the potential to be occupied by large assemblies of people during an earthquake include Ventura High School, the E.P. Foster Library, and several churches. The San Buenaventura Mission is also located in the fault hazard zone. Figure 13, entitled Land Use Acceptability Matrix, provides a summary of potential public safety risks and the acceptability of general land uses within each risk area. It is intended that this chart serve as a guide to making land use decisions.

2. Ground Shaking

a. General description: In California, the largest losses of life and property due to a geologic hazard will be caused by ground shaking in response to movement along a fault. Ground shaking is one of the most difficult seismic hazards to predict and

quantify. The extent and severity of ground shaking at a particular site is controlled by many factors including:

- Earthquake magnitude. Earthquake magnitude is commonly measured on the Richter Scale. This is an arbitrary logarithmic measurement of the total amount of energy released by an earthquake.

- Maximum ground acceleration. Maximum ground acceleration is the speed the ground moves measured in "g's." A vertical ground acceleration of 1.0 g will throw loose objects into the air.

- Near surface amplification. The presence of soils above bedrock can have an amplifying effect on earthquake shock waves. Ground shaking resulting from long period seismic shock waves is usually most severe on thick, water saturated, unconsolidated sediments, and less severe on solid bedrock. Short period seismic shock waves can have a more damaging effect on well compacted or bedrock surfaces.

- Distance from epicenter. As earthquake shock waves move through the ground, they alternate or lose energy. Over long distances this loss of energy can be significant.

- Duration of strong shaking. How long ground shaking continues plays a major role in determining the amount and extent of structural damages during an earthquake.

- Fundamental periods. Every structure has its own fundamental period or natural vibration period. If the natural vibrations of ground shaking coincide with the natural vibration period of a structure, structural damage can be greatly increased.

Intense ground shaking in areas of unconsolidated, water-bearing sediments (alluvium) or wet soils could also result in soil liquefaction, ground lurching, slumping, and lateral movement of nearly level areas. Seismic shaking can renew movement of old landslides as well as result in formation of new slides. The combination of relatively weak bedrock, deep weathering, steep slopes, and inclined bedding can combine to make hillside areas of the City highly susceptible to landslide failure during seismic shaking.

The extent of damage suffered during an earthquake can also depend on non-geologic factors. The type of building and its structural integrity can dictate the severity and extent of the damage suffered. Generally, small one, two, and three story wood and steel frame buildings have performed well in earthquakes due to their light weight and flexibility. Reinforced concrete structures will also usually perform well. Buildings constructed from non-flexible materials, such as unreinforced brick and concrete, hollow concrete block and clay tile, and adobe, are more vulnerable to earthquake damage.

It is economically infeasible using the present state-of-the-art construction techniques to build a totally

earthquake proof structure; therefore, a certain amount of risk must be accepted when using current building methods. It is possible, however, to reduce this risk to an acceptable level and build earthquake resistant structures that will not pose a collapse or loss of function hazard in strong earthquakes.

b. <u>Effects of ground shaking</u>: The primary effect of ground shaking is the damage or destruction of buildings and infrastructures, and thus, the potential for loss of life. Building damage can range from minor cracking of plaster to total collapse. Disruption of infrastructure facilities could include damage to utilities, pipelines, roads, bridges, etc.

Secondary effects can include the occurrence of ground and slope failure and possible sympathetic movement along other faults. Major costs may be incurred in the repair of damaged structures and facilities.

c. <u>Inventory of local ground shaking potential</u>: Available geologic information indicates that the potential for strong ground shaking in the Planning Area is high. Although the strongest earthquake that has been accurately recorded in Ventura County since 1934 is a 4.7 earthquake, the potential for severe ground shaking to occur as a result of movement along one of the major California faults (e.g., the San Andreas) could result in significant ground shaking related damage throughout the area.

Known major faults in San Buenaventura and throughout southern California that are considered to have the

potential to result in damaging ground shaking in the City are depicted in Figure 2. Potential amplification of ground shaking hazard areas throughout the City are shown on Figure 3.

The ground shaking hazard areas indicated on Figure 3 are based on the concept that ground shaking is partly determined by wave length period of shock waves, the thickness of the alluvium or unconsolidated material overlying relatively firm bedrock or consolidated earth material and the depth to the ground water table. The boundaries of potential ground shaking hazard areas should be considered as only approximate. The estimated response of structures and amplification of certain ranges of ground vibration may vary greatly within a given area during a given earthquake depending upon its origin (i.e., magnitude, location, distance, and depth). Present technology, however, allows determination of the likely ground response within an individual site proposed for development during an anticipated earthquake, but only after detailed geologic, seismologic, and soils engineering investigation of the site. Potential ground shaking hazard areas are further discussed below.

o Long period - strong shaking. These areas, generally located near the Ocean and Rivers, are characterized by unconsolidated alluvium, greater than 50 to 100 feet in depth and groundwater levels less than 15 feet below the surface. These areas could experience strong amplification of long period ground shaking vibrations

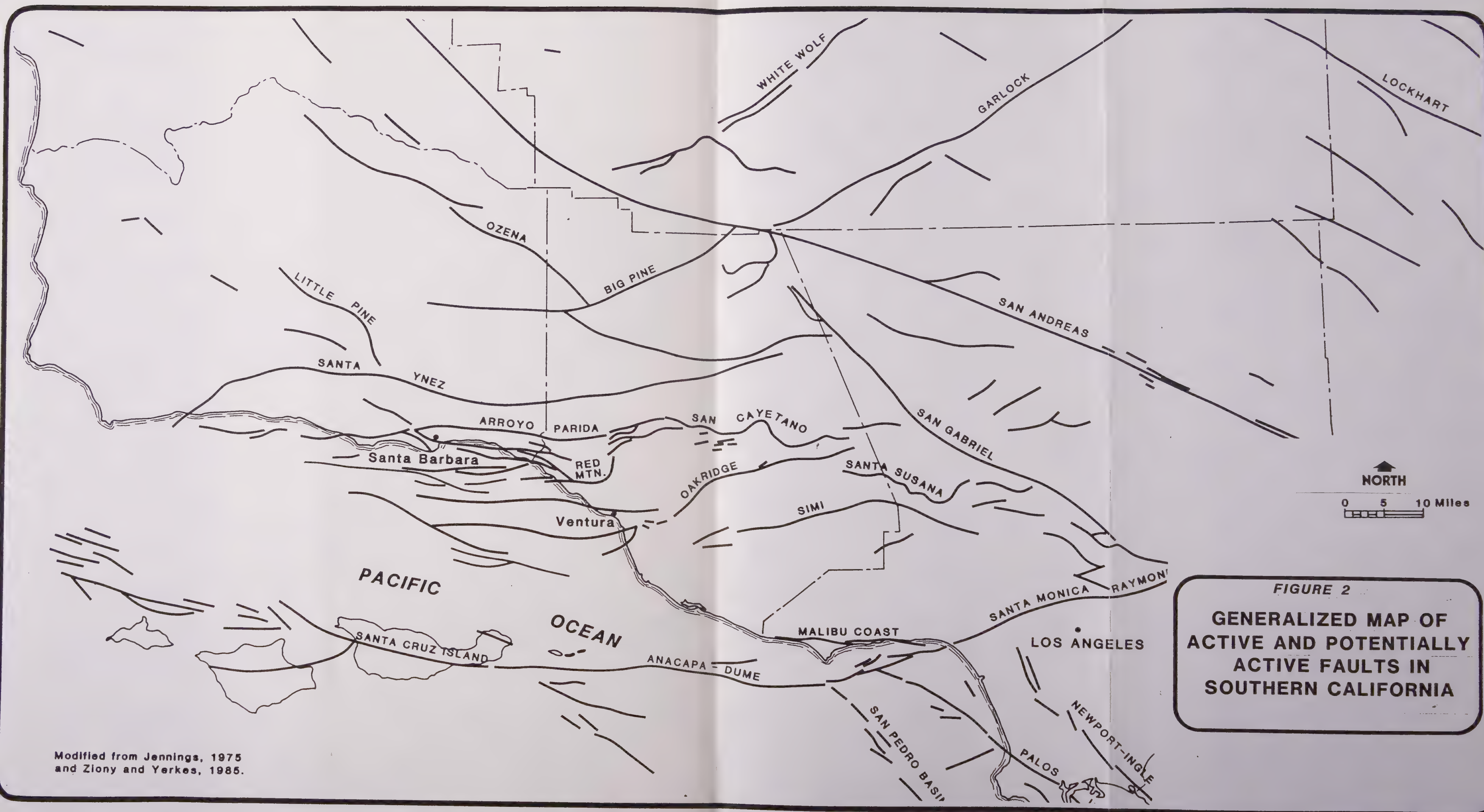


FIGURE 2

GENERALIZED MAP OF ACTIVE AND POTENTIALLY ACTIVE FAULTS IN SOUTHERN CALIFORNIA

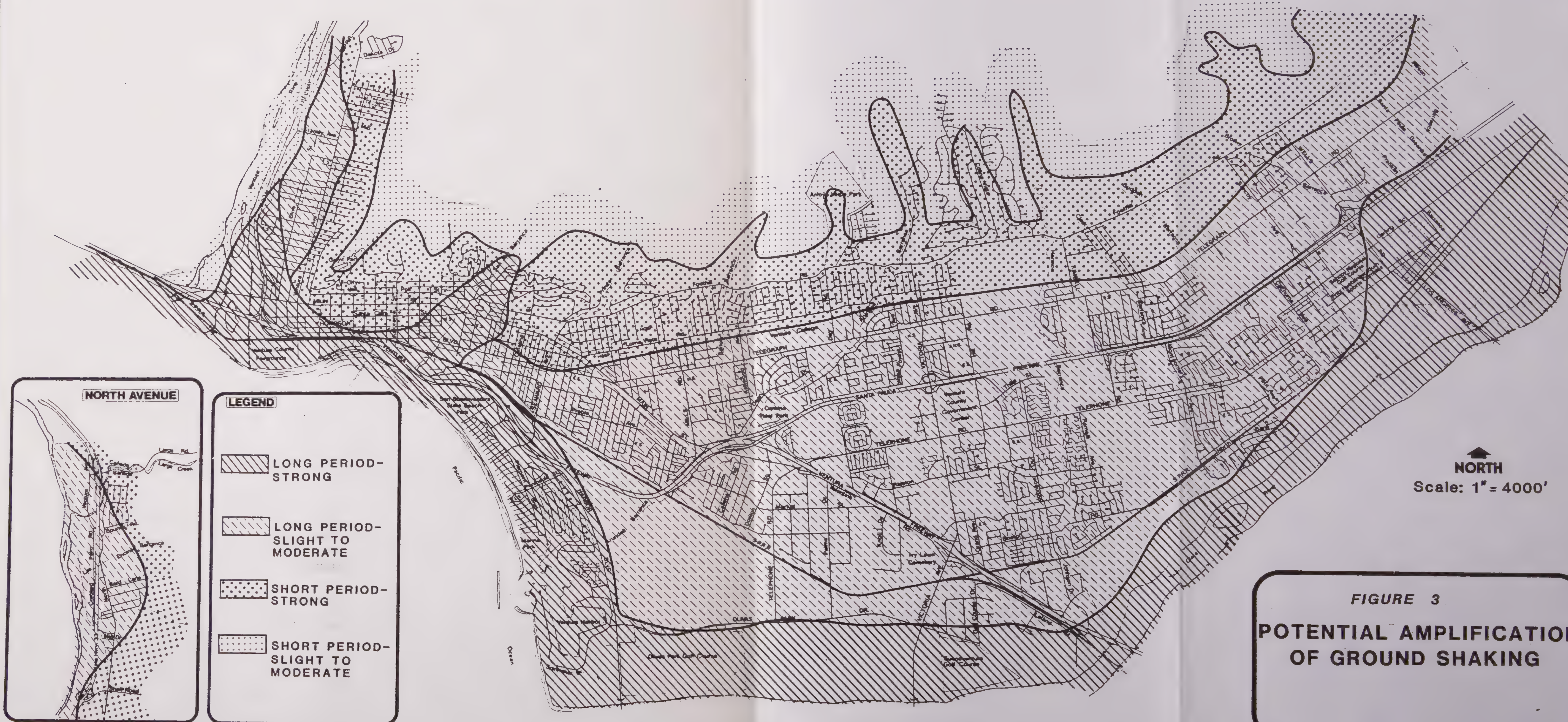


FIGURE 3

POTENTIAL AMPLIFICATION OF GROUND SHAKING

SOURCES: VENTURA COUNTY SEISMIC SAFETY/SAFETY ELEMENT
CITY OF SAN BUENAVENTURA EMERGENCY PREPAREDNESS PLAN, 1986

and could result in significant damage to multi-story structures.

- o <u>Long period slight to moderate shaking</u>. The area generally south of Telegraph Road and the west Seaward Avenue area is underlain by 50 to 100 feet of alluvium with groundwater levels more than 15 feet below the surface. These areas could experience slight to moderate amplification of long period ground vibrations.

- o <u>Short period - strong shaking</u>. The area generally north of Telegraph Road to the foothills and the east Ventura Avenue area are underlain by broken bedrock or alluvium less than 50 feet in depth. These areas could experience strong amplification of short-period ground vibrations that are particularly damaging to smaller buildings.

- o <u>Short period - slight to moderate shaking</u>. The hillside areas are generally underlain by soft sedimentary bedrock. These areas could experience slight to moderate amplification of short period ground vibrations. Other hazards, such as landslides, may significantly affect the actual hazard level.

d. <u>Local resources potentially affected by ground shaking</u>: In the event of a strong earthquake (6.0 to 7.5 magnitude) originating in southern Ventura County or a major earthquake (8.0 magnitude) along the San Andreas fault, damage to many existing structures could be severe and loss of life could occur.

Comparison of Figure 3 with present land uses in the City shows that a major portion of the Planning Area could experience damaging ground shaking. Areas near the Ocean, that may be susceptible to severe amplification of ground shaking, include such facilities as Ventura Harbor, Ventura County Fairgrounds, the Holiday Inn, promenade and pier area, the Pierpont residential area, and U. S. Highway 101.

The area south of Telegraph Road that would be likely to experience slight to moderate ground shaking amplification of long period earthquakes includes residential land uses, the County Government Center, City Police and Fire headquarters, Buenaventura Plaza, and twelve schools. Similar potentially damaging effects could occur in the west Ventura Avenue area, which includes residential development, schools, commercial and industrial buildings.

The areas north of Telegraph Road and generally north of Thompson Boulevard and east of Ventura Avenue to the foothills that could result in strong ground shaking amplification during a short-period earthquake include several schools, Ventura College, residential areas, City Hall, and the Downtown.

The Hillside Area, which could experience slight to moderate shaking during a short-period earthquake, is comprised predominantly of residential uses and open space. Landslides, however, could result in the more serious hazard to life and property in this area.

3. Liquefaction

a. General description: Liquefaction is a temporary, but substantial, loss of shear strength in granular soils, such as sand, silt, and gravel, usually occurring during or after a major earthquake. This occurs when the shock waves from an earthquake of sufficient magnitude and duration compact and decrease the volume of the soil; if drainage cannot occur, this reduction in soil volume will increase the pressure exerted on the water contained in the soil, forcing it upward to the ground surface. This process can transform stable granular material into a fluid-like state similar to quicksand.

The potential for liquefaction to occur is greatest in areas with loose, granular, low-density soils, where the water table is within 40 to 50 feet of the ground surface.

b. Effects of liquefaction: Liquefaction may manifest itself by the development of cracks in the ground surface, followed by the emergence of water from the ground. Considerable depths of water may accumulate on the ground surface, and characteristic sand boils, sand volcanoes and sand ridges, all created by the emergence of the water may form. When quicksand conditions develop, buildings and other objects on the ground surface may tilt or sink, and lightweight buried structures may float to the surface.

Extreme settling of the ground may result from liquefaction. In areas underlain by thick deposits of sediment, subsidence as much as several feet may occur, creating new shorelines in areas near bodies

of water. Ground settlement often occurs differentially because the sand and water are seldom removed evenly over broad areas. Liquefaction may also lead to the lateral spreading of soft saturated soils. This can result in the rapid or gradual loss of strength in the foundation materials so that structures built upon them gradually settle or break up as the foundation soils flow out from beneath them.

If liquefaction occurs in a layer of soil below the ground surface, the liquefied layer can act as a slip-plane, similar to ball bearings, and cause large, destructive landslides. This can occur on slopes as gentle as 2.5% (United States Geological Survey, 1974).

c. Inventory of the local liquefaction hazard: No reported incidences of liquefaction have resulted in any structural damage in the Planning Area; however, along with its attendant ground shaking, it is possibly the biggest seismic threat. Locally, eyewitness reports of the effects of the 1857 Fort Tejon Earthquake (magnitude ±8.0) on the San Andreas Fault suggest that liquefaction occurred along the Santa Clara River, along with other damage. Localized liquefaction occurred in the lower Santa Clara River during the 1973 Point Mugu earthquake, which had a magnitude of much less than the Fort Tejon Earthquake, but was centered nearby. More earthquakes of this size are possible and could result in liquefaction-related property damage.

The effects of liquefaction in the lower Santa Clara River during the 1973 Point Mugu Earthquake were mainly the development of minor ephemeral features

such as shallow cracks and sand boils; but as Morton and Campbell point out in their report, if, "...shaking had been more severe, such effects might well have been widespread and could have resulted in significant agricultural crop losses" (California Geol., Dec. 1973).

The high liquefaction hazard zone, as shown on Figure 4, covers part of the Planning Area near the Ventura River, all of the beach areas, and the area north of the Santa Clara River. Areas shown within the high liquefaction hazard zone are alluvial areas with water table levels that have been within 15 feet of the ground surface at some time in the last fifty years or since groundwater well records have been kept. There are indications that the western part of the City may be particularly susceptible to low angle landsliding or lateral spreading caused by potential liquefaction. The moderate hazard zone includes alluvial areas that have had water between 15 and 40 feet of the surface and bounds the high zone on the northeast except in the Vista Del Mar area, where the high hazard zone directly abuts the bluff.

d. Local resources potentially affected by the liquefaction hazard: Areas in the Planning Area that are likely to experience liquefaction during a seismic event include the Ventura Avenue area, beach areas, Ventura Harbor, and properties adjacent to the Santa Clara River. Although much of the area subject to liquefaction adjacent to the Santa Clara River is used for either agricultural, open space or recreational uses, several critical public and

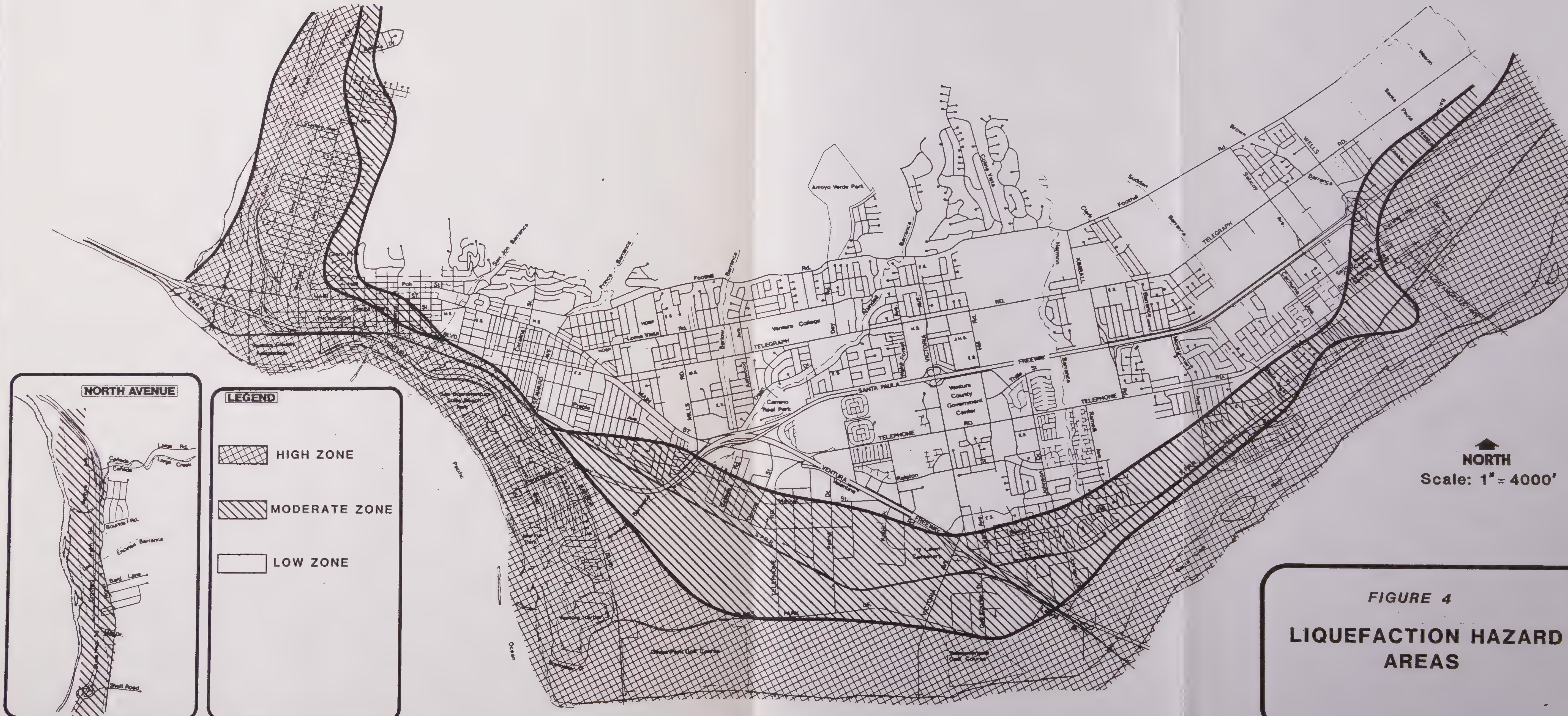


FIGURE 4

LIQUEFACTION HAZARD AREAS

SOURCES: VENTURA COUNTY SEISMIC SAFETY/SAFETY ELEMENT
CITY OF SAN BUENAVENTURA EMERGENCY PREPAREDNESS PLAN, 1974.

private facilities are located within these areas that might be subject to liquefaction. These critical facilities include the City's wastewater treatment facility near the Harbor and Fire Station No. 1 located on Ventura Avenue. Other facilities located in the high liquefaction hazard area that would have the potential to affect large numbers of people or result in significant property damage include several schools and churches, the Ventura County Fairgrounds, the Holiday Inn promenade/pier area, and the Ventura Harbor (including the surrounding commercial and industrial uses). The moderate potential liquefaction hazard zone includes two major industrial areas: the area south of U. S. 101 and the Ventura Avenue area. Liquefaction-related damage would have the greatest potential to occur in older structures located in the Ventura Avenue area that were not designed to resist settling caused by liquefaction.

The structures and areas listed above are those that are located within the boundaries of the hazard zones on Figure 4. The information used to define the potential liquefaction hazard zones was the best available, but does not allow precise delineation of the hazard areas. The hazard zone boundary lines represent a transition area that fluctuates seasonally and with changes in groundwater. Therefore, those facilities listed are not the only ones that have the potential to be affected by the hazard.

4. <u>Tsunamis</u>

a. <u>General description</u>: Tsunamis (pronounced soo-nom-ee) are large ocean waves that are generated by submarine landslides, volcanic eruptions, or earthquakes in or near ocean basins. These waves are commonly referred to by the general public as tidal waves.

The term "seismic sea wave" applies to a tsunami caused by an earthquake. These waves originate in deep water and have a long wave length (distance from the crest of one wave to the crest of the succeeding wave), normally over 100 miles and a very low amplitude (height from crest to trough). As these waves approach shallow water, the speed decreases from a deep water speed of over 600 m.p.h. to less than 30 m.p.h., as they move across the beach. The wave energy is transferred from wave speed (velocity) to wave height (amplitude) and waves as high as 100 feet can be formed.

Tsunamis are a unique hazard because the arrival time of a wave generated far out at sea can be predicted quite accurately to within a minute and a half per elapsed hours. Unfortunately, the intensity of the wave when it reaches shore cannot be predicted. The threat of the tsunami hazard is compounded by the fact that the waves can come in succession over a period of ten to twelve hours, making the duration of the threat quite long. Tsunamis are sometimes preceded by a trough or recession of ocean water that frequently attracts people down to the shore to examine what appears to be an extremely low tide. The wave itself, may follow the trough by 15 to 45

minutes. Tsunamis can also travel considerable distances inland on waterways, particularly those with shallow gradients.

b. Effects of tsunamis: Tsunamis are a threat, not because they are extensive or frequent, but because the destruction they cause can be devastating. The danger is also compounded by the fact that the intensity of the wave is unpredictable and the threat is intermittent over many hours.

The tsunami threat is mainly confined to the immediate beach areas and river channels. Beach areas have historically been affected up to a mile or more inland in very flat areas. Tsunamis can also proceed up flowing rivers for many miles if the gradient of the river is shallow. The effects of the tsunami waves are most noticeable on man-made features, but the waves can also change river channels and modify coastal landforms. Damage to features in the path of a tsunami cannot be avoided, but when enough time occurs for a warning to be issued, no loss of life should occur if the necessary precautions are taken.

The immediate or primary effects of a tsunami can be widespread and disastrous, resulting in the complete destruction of coastal structures. The secondary effects can include: contaminated water systems, power disruptions, blocked or dislocated transportation systems, increased occurrence of fires from broken oil and gas tanks or lines, flooding from blocked rivers, pollution, etc.

c. Inventory of the local tsunami hazard: A tsunami threat exists to the entire coastal area of the

Planning Area as well as the lower reaches of both of the rivers. Based upon the historic record, tsunamis are rare occurrences, but one could affect this area at any time. The last major wave hit the City in 1812, but minor tsunamis have been recorded as recently as 1964.

Tsunamis are not common in California and the recurrence interval seems to be large; however, the historical record is not extensive enough to develop recurrence predictions. The worst recorded tsunami to hit California was in 1812. An earthquake occurred in the Santa Barbara Channel, and the resulting waves are reported by some disputed sources to have been up to 50 feet above sea level at Gaviota (Richter), and 35 feet above sea level at Santa Barbara. They were probably at least 15 feet above sea level at Ventura.

Widespread damage and some tsunami-caused loss of life occurred following the 1964 Alaskan Earthquake. Tsunamis from that earthquake destroyed a number of towns in Alaska and caused over $300,000 damage to the Los Angeles-Long Beach harbors and approximately $35,000 damage to the marinas in Ventura County. The damage in Ventura Harbor, which was mainly to the channel banks, was caused by the rapid and extreme changes in sea level.

The historic record indicates that there is a small probability of occurrence of a major tsunami in the Planning Area. Statistically it has been over 160 years since the last major tsunami, but several smaller, unrecorded tsunamis may have occurred.

All of the coastal areas in the City are susceptible to tsunamis. A tsunami from the north Pacific could move down the Santa Barbara Channel and affect the northerly coastal areas. A tsunami originating from the South Pacific or from South America could strike the coastal areas from the south to southwest. A tsunami generated from movement along one of the faults located within the Santa Barbara Channel could affect most of the coastal areas, because the Channel Islands would not provide any protection.

The uncertainty of local effects makes the definition of a hazard zone difficult. Based on the historical accounts of tsunami wave run-up (approximately 15 feet above sea level), areas in the Planning Area that are less than 20 feet above sea level and within one mile of the mean high tide line are considered to be tsunami hazard zones (see Figure 5). This zone includes areas east of the Ventura River, south of Main Street, and west of Palm Street. Another hazard zone includes the area east of Palm Street, the area south of U.S. Highway 101 to Sanjon Road, and all areas below the Vista Del Mar bluffs to the Santa Clara River flood plain. The tsunami hazard zone also extends inland along the Santa Clara and Ventura Rivers to reflect the potential for tsunami waves to travel up the river channels. These hazard zones extend an additional one mile (2 miles total) from the mean high tide line. All of these areas are recommended for evacuation in the event of tsunamis.

Local resources affected by the tsunami hazard: Development on the beach side of Highway 101 could suffer damage from a major tsunami or series of waves.

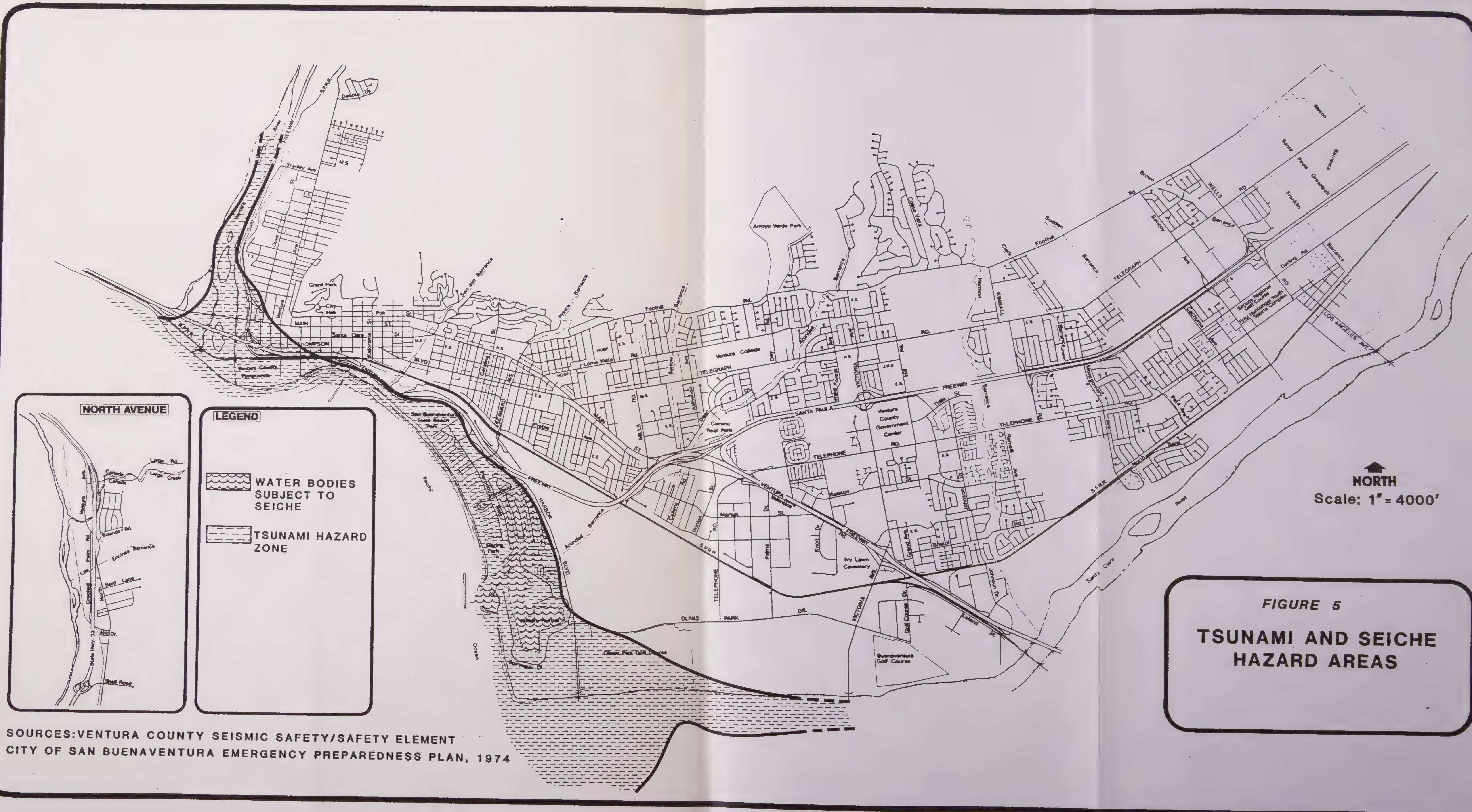


FIGURE 5

TSUNAMI AND SEICHE HAZARD AREAS

The Pierpont/Ventura Keys area and the area below the Vista Del Mar bluffs was originally a low tidal swamp and is highly susceptible to tsunamis.

In a major tsunami, all ocean front structures from the pier to the Fairgrounds could be damaged. The San Buenaventura State Park could be disrupted and flooded in places, and the Southern Pacific Railroad and the Ventura and Santa Clara River highway bridges could be damaged.

Some of the more extensive property damage from a major tsunami could take place in Ventura Harbor where the wave could not only wash over the beach, but be transmitted by the Harbor waters, giving a double wave effect. The Harbor could be damaged in even a minor tsunami, due to rapid and extreme changes in sea level.

5. Seiche

a. General description: A seiche (pronounced sãsh) is a wave or series of waves or oscillations, set up in an enclosed or partially enclosed body of water by wind, earthquake or landslide. The most common seiches are set up in lakes and bays, either directly or indirectly by earthquakes. The shaking of an earthquake can set up large and destructive oscillations, sending waves tens of feet above normal lake level. In harbors and bays, these waves can destroy harbor and shore facilities. Indirectly, tsunamis, by causing a rapid change in sea level or more commonly by the wave itself, can set up smaller internal oscillations in bays and harbors. These seiches are very

similar to tsunamis, but the waves are smaller and of lower energy. Fault displacement under a reservoir can either displace a quantity of water or tilt the lake bed suddenly, producing waves by either effect. Earthquakes can also trigger landslides. Whether triggered seismically or in some other manner, landslides can be by far the most destructive type of seiche (see Landslide section). A landslide into an enclosed body of water can produce massive waves, especially on the shore opposite the slide.

Although it is possible to measure the slow ground surface movement that sometimes precedes a landslide, methods for the detection of landslides and other seiche-producing agents are still not generally effective.

b. Effects of the seiche: The primary threat of a seiche is to structures and facilities in or very near a lake, harbor or bay. Seiches can heavily damage boats and wharfage and inundate buildings and campgrounds. Only in the unlikely event of an extremely severe seiche would loss of life be likely from the seiche itself. This is not the case, however, with the secondary effects.

The secondary effects of a seiche can often produce more damage than the seiche itself. Large seiches can overtop the dams of man-made lakes and reservoirs, causing flooding in the areas downstream. This overtopping can also wash out earthfill dams, causing their complete collapse.

The extent of most seiches is small, usually no more than ten to twenty feet above water level, and the duration is short, usually only a few minutes; however, a landslide can displace and cause a wave to travel hundreds of feet up the opposite shore of a body of water. Also, tsunami-caused seiches can last for many hours due to the possible rejuvenation of the seiche by each passing tsunami crest; however, each seiche would last only a few minutes and be of decreasing severity.

It appears that the actual threat posed by seiches is small, and probably the most remote of the hazards studied, although, not necessarily the least severe.

c. Local inventory of the seiche hazard: A hazard from seiches does exist in the Planning Area, but the threat is considered remote. Only facilities in, or very near, enclosed bodies of water could be immediately affected. No recorded seiche has ever occurred in Ventura County, but the damage to the Ventura Harbor from a seiche could possibly be similar to that caused by the tsunami of 1964 (see Tsunami Hazard).

The seiche hazard zone surrounds Ventura Harbor and the water channels within the nearby Ventura Keys residential area up to an elevation of 10 feet above the water level. The ten- foot figure is an estimate due to lack of information about the hazard.

B. SLOPE AND GROUND STABILITY HAZARDS

Certain soil and ground conditions can result in poor or unstable foundations for structures. These slope and ground stability problems can be significant hazards to structures and their occupants. Although not directly related to seismic hazards, earthquakes can also induce slope failures.

1. Landslides

a. General description: The occurrence of landslides is a part of the continuous, natural process of the downhill movement of soil, rock, and rock debris. The speed of which this earth material moves downslope can range from the almost imperceptible creep of soil and rock material to sudden mass movements of an entire hillside. Mudflows are a particularly destructive form of landslide that can be prevalent after brush and wildfires. Composed of mostly unconsolidated material, which is usually saturated with water and characterized by a plasticity, mudflows can spread over wide areas and move greater distances than other types of landslides. These events occur naturally, with or without human activity. Human interference, however, can often increase the frequency and extent of landslides.

Landslides result from the relationship between forces that tend to make earth material slide (driving forces) and forces that tend to oppose such movement (resisting forces). Driving forces acting on a slope are the weight of the slope material, and the weight of objects placed on the slope, such as water, buildings, artificial fill, swimming pools, etc. Resisting forces are supplied mainly by the shear strength of the slope material, or the ability of the slope to

support its own weight and resist the forces of gravity that try to pull it downhill. Resisting forces can be lowered most readily by the addition of water to the slope, as water will add excess weight to the slope material and act as a lubricant to facilitate movement. Landslides commonly occur during and after earthquakes as shocks and ground vibrations. They can act as the immediate cause, or as a triggering device, setting unstable ground or debris material into motion. Hillside development can also make a stable slope unstable by creating man-made cuts that steepen the slope angle, increase the height of the slope, and place extra weight loads on the slope.

Methods to control landslide movement can include dewatering hillsides, buttressing the slide or actually removing the unstable earth material. The cost of this corrective work can be prohibitive. However, one potential method of distributing this cost is to establish and implement a Geologic Hazard Abatement District (GHAD) in which the cost of corrective work is shared by all affected property owners.

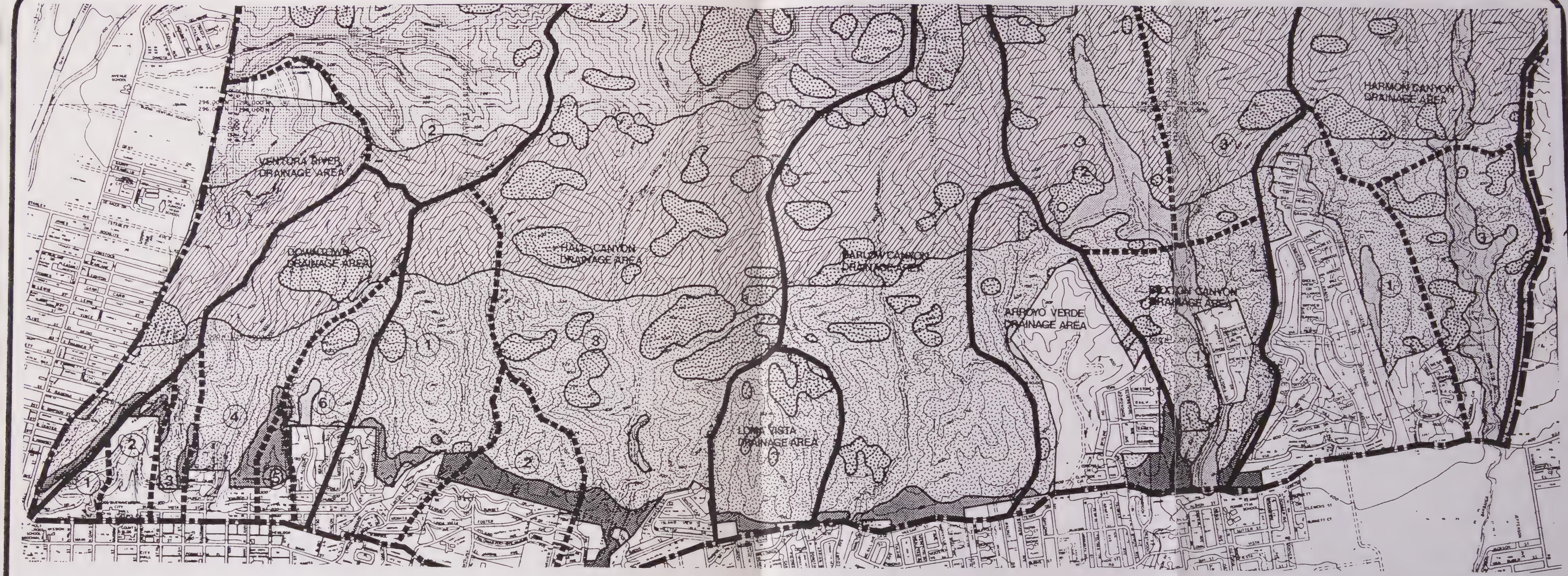
b. Effects of landslides: Slope instability resulting in landslides can cause substantial damage and disruption to buildings and infrastructure. Some of these losses can include possible loss of life; displacement and destruction of buildings, roadways, and other improvements; blockage of drainage channels; disruption of transportation and communication systems; and the loss and disruption of utilities and pipelines.

A secondary effect of the landslide hazard, which could have significant future impacts, are lawsuits

initiated against the developer of the property affected by the landslide, as well as the present owners and the governmental agencies that may have reviewed the development, approved the plans, and issued grading and/or building permits.

c. Inventory of the local landslide hazard: Most of the developed portions of the Planning Area are relatively flat and are not subject to a significant landslide hazard. The Hillside Area located north of Poli Street/Foothill Road and east of Ventura Avenue and Cedar Street contain many existing landslides and are likely to experience future landslide activity. The major concentration of existing landslides occurs within the northern portions of the Hall and Barlow Canyon drainage areas (Impacts of Hillside Development EIR, 1977). Other landslides are scattered throughout the Hillside Area and generally occur on hillsides with slopes of 30 percent or greater, although slides may occur on less steep slopes.

Existing landslides in the Hillside Area were mapped in 1977 as part of the City's original Hillside Management Program and are shown on Figure 6. Figure 6 also indicates locations of marginal stability and potential for major landsliding. The Pico and Santa Barbara geologic formations, which comprise the majority of the hillsides in the Planning Area, are known to be subject to landslides on a widespread basis. Remaining areas covered by the San Pedro formation on the lower slopes are considered somewhat less prone to landsliding and ground failures, although landslides in this area have occurred. The direction a slope faces also affects susceptibility to ground



LEGEND

- MAJOR DRAINAGE AREA
- MINOR DRAINAGE AREA
- HILLSIDE STUDY AREA

- ALLUVIUM
- TERRACE DEPOSITS
- SAN PEDRO FORMATION
- SANTA BARBARA FORMATION
- PICO FORMATION
- LANDSLIDES

N
SCALE
1"-2000'

FIGURE 6

EXISTING AND POTENTIAL LANDSLIDE AREAS

failures. South-facing slopes conforming with the bedding planes are generally considered more prone to ground failures, regardless of the underlying geology. The Pico formation represents the greatest hazard in south-facing slopes.

The area adjacent to the Prince Barranca has been identified as an ancient landslide area that could be reactivated by strong ground shaking.

d. Local resources affected by landslide hazard: The Hillside Area in the landslide hazard zone are now largely undeveloped except for a few extensions of residential development into the foothills; however, a possibility of damage from the landslides exists in areas built prior to current grading ordinance and building code requirements. As more development occurs in the Hillside Area, more structures will be exposed to potential landslide and ground failure hazards. Without proper site investigation and preparation, the probability of damaging landslides will increase.

Comparison of Figure 6 with present land uses within the City indicates that primarily residential structures are located within the hazard area north of Foothill Road. Also included within this area are portions of De Anza Junior High School, the City Hall, and the San Buenaventura Mission. None of the existing structures are known to be in immediate danger of being affected by landsliding; however, detailed information on individual structures has not been evaluated.

2. Subsidence

a. General description: In California, four types of subsidence, caused by human activity, have been identified, in addition to those forms of the hazard that occur naturally. Named after the action that causes the subsidence, these are groundwater withdrawal subsidence, oil or gas withdrawal subsidence, hydrocompaction subsidence, and peat oxidation subsidence. Of all of these types, groundwater withdrawal subsidence, which generally occurs in valley areas underlain by alluvium, is the most extensive and most costly. This type of subsidence occurs as a result of the extraction of a large quantity of water from an unconsolidated aquifer. As water is removed from the aquifer, the total weight of the overburden, which the water once helped support, is placed on the alluvial structure and compressed.

If fine-grained silts and clays make up portions of the aquifer, the additional load can squeeze the water out of these layers and into the coarser grained portions of the aquifer. All of this compaction produces a net loss in volume and hence a subsidence of the land surface. A very similar sequence of events leads to subsidence with oil and gas withdrawals. In fact, oil extraction has resulted in the greatest subsidence on record. In the Wilmington Oil Field, near Long Beach, a subsidence of 29 feet was recorded in the period 1928 to 1972. The two other forms of subsidence, peat oxidation and hydrocompaction, are rather localized. No evidence exists of their occurrence in the Planning Area.

b. <u>General effects of subsidence:</u> The damage caused by subsidence is generally not of an immediate or violent nature. Except when prompted by seismic shaking, the compaction of alluvium and settling of the land surface occurs slowly over many years.

Subsidence resulting from groundwater or oil and gas withdrawal can be responsible for numerous structural effects. Most seriously affected are long, surface infrastructure facilities that are sensitive to slight changes in gradient. These include wells, canals, sewers, and storm drains.

Gradual inundation should be viewed as a potentially serious secondary effect of subsidence, as both the Ocean and the Santa Clara River could flow into depressed areas. In the case of the coastal portion of the City, beach erosion could extend further inland due to the additional loss of elevation caused by subsidence.

c. <u>Inventory of the local subsidence hazard</u>: A subsidence problem exists, mainly along the coast and generally adjacent to the Santa Clara River. Probably it will continue, possibly at an increasing rate. This could occur if extraction of fluids from this area increases.

The Oxnard Plain, which comprises a very large area of Ventura County, is experiencing subsidence. The U. S. Coast and Geodetic Survey has monitored this area since the 1930s. Records to 1968 show a dozen bench

marks that have settled a foot during a fifteen to twenty year period.

Figure 7 shows three subsidence zones in the Planning Area. These zones are: probable subsidence of approximately 0.05 feet/year; probable subsidence of less than 0.05 feet/year; and the estimated limit of areas presently affected by subsidence. The first and most severe of these categories extends roughly from the Pierpont area on the west to the intersection of U. S. Highway 101 with the Santa Clara River on the east.

d. Local resources affected by subsidence: Property damage due to subsidence can and does occur over a long period of time. Loss of life would probably occur only as a secondary effect of subsidence, possibly from flooding. Drainage courses, wells, and utility lines are potentially the most vulnerable to damage.

3. Expansive Soils

a. General description: Expansive soils, or soils with a high shrink-swell potential, are generally clayey, expanding or swelling when wetted and contracting or shrinking when dried. Wetting can occur naturally in a number of ways (i.e., absorption from the air, rainfall, groundwater fluctuations, lawn watering, broken water or sewer lines, etc.).

As expansive soils expand and contract in the hillsides, a gradual downslope movement or creep of the soil material may occur. This downward soil movement may eventually result in a landslide. Clay soils also

FIGURE 7

POTENTIAL SUBSIDENCE AND EXPANSIVE SOIL AREAS

SOURCE: VENTURA COUNTY SEISMIC SAFETY/SAFETY ELEMENT, IMPACTS OF HILLSIDE DEVELOPMENT EIR

retain water and may act as a lubricated slippage plane between other soil/rock strata, resulting in a landslide. These types of landslides are often triggered by earthquakes or by unusually moist conditions. Expansive soils are also often prone to excessive erosion.

In most instances, expansive soil conditions can be reasonably mitigated through remedial building design measures and do not seriously restrict the suitability for development. In combination with unstable slopes, however, expansive soil conditions can pose a significant development hazard.

b. Effects of expansive soil: When structures are placed on expansive soils, foundations may rise each wet season and fall with the succeeding dry season. Movements may vary under different parts of a structure causing foundations, walls, and ceilings to crack, various structural portions of the building to become distorted, and doors and windows to warp. Signs of soil creep can be seen in such features as curved trees, and tilted fence and telephone poles.

c. Inventory of the local expansive soil hazard: Several zones of highly expansive soils are in the foothills of the Planning Area. The Santa Barbara and Pico geologic formations commonly contain expansive soils. Two other significant areas of high shrink-swell potential are located near the intersections of Harbor Boulevard and Olivas Park Drive and Victoria Avenue and Olivas Park Drive. Most of the remaining portions of the Planning Area are classed as having moderately expansive soil.

As development occurs in the Hillside Area, more structures will be exposed to potentially damaging expansive soil/soil creep conditions. Continued enforcement of existing building codes, grading criteria, and the Hillside Management Program, however, should reduce this hazard to an insignificant level. Figure 7 depicts expansive soil zones throughout the City.

d. Local resources affected by expansive soil: Past problems involving residential development have centered in the Hillside Area. Since the adoption of modern building codes that require soil tests and adequate building and foundation design measures, only a few incidents have been recorded. Problems relate mainly to the cracking and buckling of the foundations of homes.

C. WATER HAZARDS

Exposure of the public to water-related hazards may result from several potential causes. In the Ventura Planning Area these include flooding, beach erosion, and dam failure.

1. Flooding

a. General description: A flood may be defined as a temporary rise in stream flow that results in water overtopping its banks and inundating areas adjacent to the channel not normally covered with water. The flood plain is the relatively flat or lowland area adjoining the stream, which is subject to periodic inundation by floodwater.

The magnitude of a flood is measured in terms of its peak discharge, which is the maximum volume of water (in cubic feet per second) passing a point along the channel. Floods, however, are usually described in terms of their frequency of occurrence. For example, the 100-year flood represents the flood magnitude with a 1% chance of being equaled or exceeded in any given year. There is a certain element of risk involved in using this type of designation as the prediction of a flood of a particular magnitude is based on probability and involves an element of chance. According to statistical averages, a 25-year flood should occur on the average of once every 25 years, but two 25-year floods could conceivably occur in any one year. For planning purposes, the 100-year flood magnitude is most often used to delineate flood plain boundaries.

Flooding is basically a direct response to the amount, distribution, and intensity of precipitation. Most storms are relatively small and do not seriously disrupt people and the land. Occasionally, however, a storm of great magnitude will occur, causing serious damage and disruption to the landscape and its inhabitants. The relationship between great storms and their rates of occurrence is known as the magnitude-frequency concept. The magnitude of an event refers to its size (the height of flood waters), and the frequency refers to the number of times a given event occurs during some specified time period. Fortunately, magnitude and frequency are inversely related (i.e., events of great magnitude and force occur infrequently, and vice versa).

Flooding is a naturally occurring event with some long-range beneficial effects, such as the replenishment of beach sand and nutrients to agricultural lands and the ocean. Flooding is perceived as a hazard because people have found that flood plains are flat fertile lands, and are often convenient and desirable places to live. A dangerous misconception about the flooding hazard is often held by people who accept the old expression "lightning doesn't strike in the same place twice." There is an assumption made here that once a major flood (such as a 50-year or 100-year flood) has been experienced, the area flooded is safe for another 50 or 100 years. Often, in areas where rapid urban development is taking place, quite the opposite is true; the potential for more frequent floods is created. As mentioned earlier, flood probabilities are based on chance and, therefore, are not infallible.

b. Effects of flooding: The extent of damage caused by any flood depends on the topography of the area flooded, depth, and duration of flooding, velocity of flow, rate of water rise, the extent of development and land use on the flood plain, the sediment load deposited by the flood, and the effectiveness of forecasting, warnings, and emergency operations.

Primary effects of flooding include injury and loss of life, damage to structures caused by swift currents, debris, and sediment, disruption of communication and transportation facilities, severe erosion, loss of vegetation and crops from sediment deposition, health hazards from ruptured sewage lines and

damaged septic tanks, and the disruption of utilities and vital public services.

Secondary effects of flooding place a burden on local and national taxpayers and resources. Evacuation relief and flood-fighting services, clean-up operations, and the repair of public facilities are paid for by the public. The construction and maintenance of flood prevention and control facilities are also paid for by taxpayers.

c. Influences on flooding impact: The magnitude and frequency of flooding events can be influenced by many factors. Natural and artificially-induced changes to the characteristics of the drainage basin and flood plain of a stream can have profound effects on the extent and severity of any particular flood.

The growth of brush and trees within the flood plain can act as natural obstructions to floodwater flow, by creating a backwater effect and increasing floodwater heights. Flood heights may also be naturally increased by the occurrence of fire in a watershed preceding heavy rainfall, resulting in an increase in storm runoff and sediment production, and by previous rainfall saturating the ground, thus decreasing its ability to absorb additional moisture.

The encroachment of urban development is perhaps the most serious artificially-induced change in drainage basin and flood plain charactertistics that can influence the magnitude and frequency of flooding. Urbanization often leads to a greater percentage of impervious ground surfaces (i.e., pavement, concrete, roof-

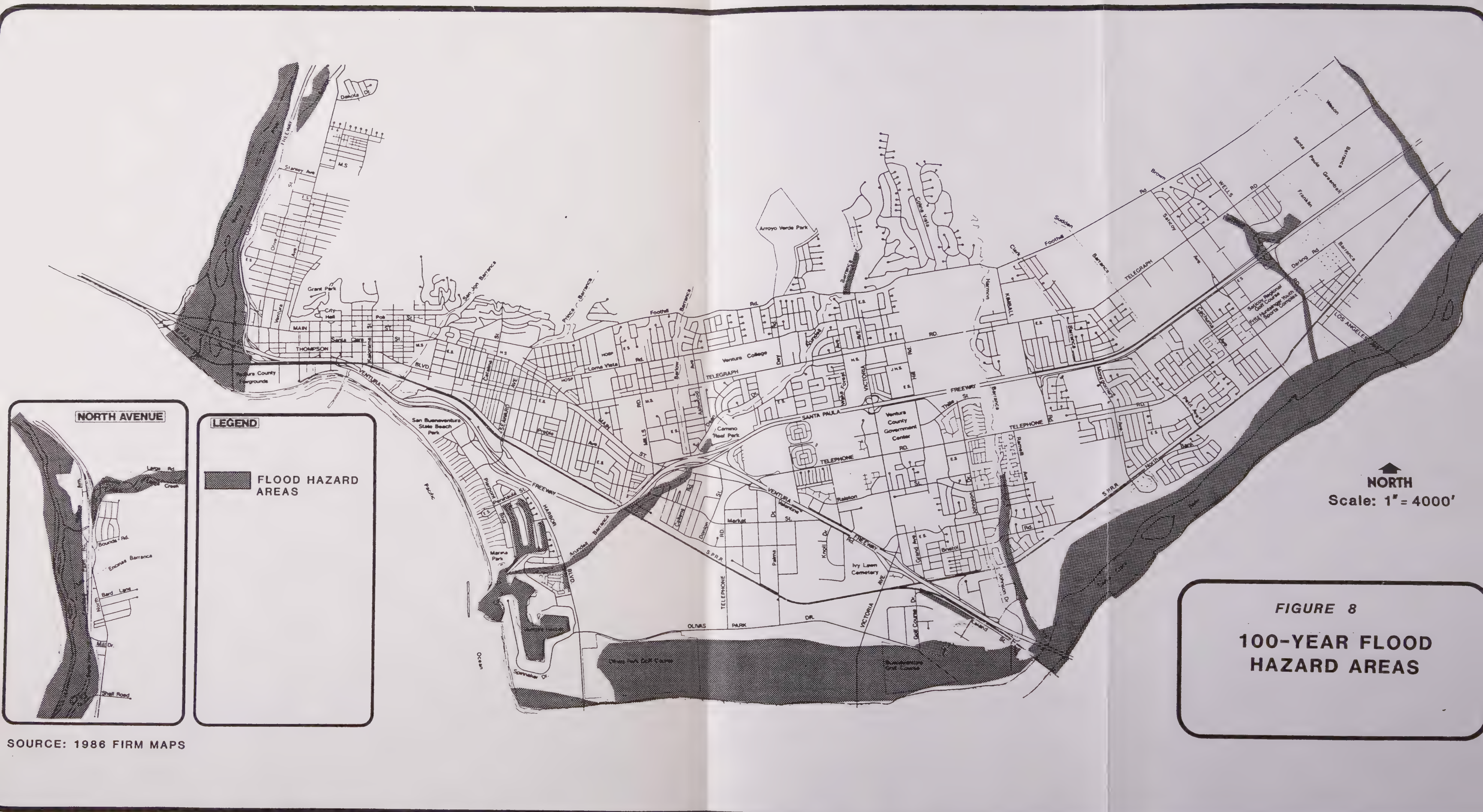
tops, etc.), which tends to increase the total volume of storm runoff by decreasing the amount of water infiltrating into the ground. Impervious surface material will also decrease the time lag between when the rainfall hits the ground and when it collects to be carried away by streams, storms sewers, etc. The combined effect of increased runoff and decreased lag time will cause more frequent and severe floods. Urban development can also result in structures, artificial fill, and other objects being placed on the flood plain. This will act to reduce the space available for storing floodwaters, causing the water level and rate of flow to increase. Bridges and other stream crossings also serve as flow obstructions where brush, trees, and other debris washed away and carried downstream collect. As flood flows increase, masses of debris may break loose, sending a wall of water surging downstream; or the debris may have a damming effect until the pressure of the water exceeds the structural capability of the bridge and washes it away.

To protect urban development from the impacts of flooding, stream channels are often channelized (straightened, lined, etc.) to move the water off the land more efficiently. However, when emerging from the channelized section of the stream, water is often delivered to the unchannelized downstream section at rates and velocities natural section of stream is not capable of adequately carrying. Piecemeal channelization efforts often exacerbate the flooding potential downstream.

d. <u>Inventory of the local flood hazard</u>: The largest and most damaging recorded natural floods in the Ventura River and Santa Clara River watersheds occurred in 1969. In that year, the 50- and 100-year peak discharges were exceeded in both river channels. The combined effects of the 1969 floods were disastrous; thirteen people lost their lives and property damage was estimated at 60 million dollars. The City's wastewater treatment facility was severely damaged resulting in the discharge of raw sewage onto local beaches. The floods also caused several million dollars worth of damage at the Ventura Harbor. Large amounts of sediment flowed into the Harbor and had to be removed to restore use of the waterways. After the flood, the sediment was moved from the Harbor to the Olivas Park golf course, which elevated the golf course enough to act as a dam and narrowed the extent of the Santa Clara River flood plain.

Figure 8 shows areas in the City subject to inundation by the 100-year flood. The flood boundaries are derived from the September 1986, Flood Insurance Rate Maps (FIRM) compiled for the Federal Insurance Administration to implement the National Flood Insurance Act. The official FIRM maps should be consulted when assessing potential flood hazards at a particular property.

The 100-year flood hazard area for the Ventura River is relatively small due to a levee constructed along the east bank of the river by the Army Corps of Engineers in 1948 to protect the western part of the City. Therefore, the 100-year flood hazard from the Ventura River is confined to an area west of the


NORTH AVENUE
LEGEND
FLOOD HAZARD AREAS
NORTH
Scale: 1" = 4000'
FIGURE 8
100-YEAR FLOOD HAZARD AREAS
SOURCE: 1986 FIRM MAPS

levee and near the River mouth (see Figure 8). A 100-year flood along the Santa Clara River would affect a fairly limited area of the City located just north of the river, in the vicinity of the Olivas Park and Buenaventura golf courses.

Other areas of the City that could potentially experience flooding impacts as a result of a 100-year storm include areas adjacent to the Arundell Barranca south of Main Street; the Harmon Barranca south of Ralston Street; and the Brown Barranca generally south of Telegraph Road.

The September 1986 FIRM maps depict a 100-year flood area along the Arundell Barranca north of Foothill Road; however, flood control measures have been recently installed in that area, thereby reducing the 100-year flood plain. Additionally, future flood control measures are planned to channelize the Brown Barranca to reduce that 100-year flood hazard area.

e. <u>Local resources affected by flood hazard</u>: Floods are natural occurrences whose frequency and magnitude depend on the rainfall and drainage patterns. It can reasonably be expected that properties within the 100-year flood plains of major drainage channels will experience significant flooding impacts on the average of once every 100 years.

The 100-year flood plain of the Ventura River is primarily confined to properties that are predominantly vacant, along the western bank of the river. Service along sections of Highway 101 and the railroad tracks may be interrupted due to flooding impacts. The

Santa Clara River 100-year flood plain includes only a small beach area, the Buenaventura Municipal and Olivas Park Municipal golf courses, and agricultural land uses.

Floodwaters of the Arundell Barranca would impact agricultural fields and possibly a few residences. Residences and commercial businesses would be affected by floodwaters from the Brown Barranca.

Although structural flood control measures are perhaps some of the most feasible solutions for protecting existing development in a flood prone area, limiting new development in a flood plain would assure minimal risk, damage, and alteration of a natural drainage course. The City adopted a flood plain ordinance in September, 1986 to limit new development on flood plains in accordance with requirements of the National Flood Insurance Program. In general, new development is limited to agriculture, recreation, and appropriate public facilities. Existing industrial development is permitted to expand to the identified limits of a property.

2. Beach Erosion

a. General description: The beach is in a perpetual state of dynamic disequilibrium, adjusting to changes in waves, currents, tides, and sediment deposition. These forces create a flow of sand along the coastline known as the littoral drift. Beaches remain stable only when the amount of sand deposited is equal to the amount of sand taken away, both of which are primarily determined by the littoral drift.

Because these two factors only rarely balance each other exactly, beaches are usually either receding or advancing at any one point in time.

Sandy beaches are formed largely by the weathering of inland rocks and riverine transport of sediment to the sea. The sand that maintains City beaches travels with the littoral drift from north to south, originating from the Ventura River and from beaches up coast of the Ventura River.

During periods of increased wave activity, waves striking the beaches can cause the coastline to dramatically recede, because more sand is taken away than is deposited. Sandy beaches often serve as a natural buffer between the sea and the easily erodible upland. A wide flat beach just above the waterline permit of the coming waves to dissipate without damage, rather than allowing intensive damage as would a narrow, eroding beach. A highly eroded beach loses much of its protective capability.

Coastal erosion in Southern California has seasonal trends and other natural cycles in addition to the dramatic fluctuations occurring from heavy storms. The beaches can change from month to month in response to tidal fluctuations; they generally advance and have moderate wave activity in the summer months, and recede during the rest of the year in response to increased wave activity. Long-term advancement or erosion of beaches is affected by long-term cyclic weather patterns of wet and dry periods.

Like nature, humans have the ability to alter the configuration of the shoreline by inducing long-term or short-term erosion. The construction of groins, jetties, seawalls, and breakwaters are the primary structural measures used to impede beach erosion. Each is at best a partial, short-term solution to erosion problems. Groins, for example, can trap littoral sand and build beaches out over a certain area, but by doing so they reduce the amount of sand that flows to downcurrent beaches and, therefore, may relocate the original problem by causing erosion in other areas. Breakwaters and jetties, which are typically employed to protect harbors from wave activity, have similar down-current effects on the littoral drift of sand, although the mechanics are different. Because jetties are longer than groins, they interfere with sand flow to a greater degree. Therefore, sand passing is usually required to replenish down-current beaches. Seawalls can provide a line of defense for homes against the onslaught of waves, but tend to reflect the energy of the waves backward, gouging out sand seaward of the wall during high swells. Although property is protected, the beach between the property and the sea is more quickly reduced and public recreational area is diminished.

Dams for water retention have the ability to contribute to beach erosion in several ways. Because they trap practically all of the sediment in the river or stream, they reduce the watershed area capable of supplying sand to the beach. On the West Coast, where rivers and streams are by far the major source of sea sediment, flood control measures to protect development in flood plains and water supply dams are

estimated to trap 50% of the sediment that once replenished the beaches.

In 1961, the Army Corps of Engineers identified the existence of dams on the Ventura and Santa Clara Rivers as an important cause of current and continuing beach erosion in Ventura County. Their findings were used as one of the justifications for the construction of beach groins at the Pierpont beach. The Army Corps of Engineers Environmental Impact Statement for the Ventura Harbor states that "future reductions in the rate of supply of sand from river sources to the beaches down coast from Ventura Harbor, occasioned by the construction of upstream reservoirs, may cause long-term erosion in this area (unless measures such as groin construction) are taken to protect the beaches from erosion" (U. S. Army, September 1970).

Public benefits are associated with dam and flood control operations, such as the protection of life and property, water conservation, recreation and the opening of land to development and agriculture. Some of these benefits may be considered of greater public importance than the preservation of our beaches; however, property loss can also occur from beach erosion. Additionally, the beaches constitute a resource of great economic and aesthetic value. Difficult decisions are not always necessary, because remedial measures often can be incorporated into stream development structures. At least modifying present thinking by regularly considering beach sand supply in all new stream development programs could occur.

b. Effects of beach erosion: Erosion of beach sand removes the natural barrier that protects landforms and structures from potentially destructive wave action. The end result can be the direct destruction of homes and other structures as foundations are undermined by the advancing sea and the structures are damaged by waves whose force is no longer dissipated by wide beaches. Because erosion reduces the protective capability of the beach against waves, there is an increased potential for flooding hazard in areas of low land profile during storm activity.

Beach erosion can also reduce the amount of recreational beach available to the public, although this is usually only a temporary effect, because the amount of beach available for recreation has always fluctuated due to natural beach erosion cycles. Construction of beach erosion control structures (i.e., groins, jetties, and seawalls) can have a more long-term and pronounced effect on beach sites resulting in significant amounts of sand deposition or erosion.

The cost to taxpayers is a secondary effect of beach erosion. The public must pay for street and utility damage, and fund rescue and clean-up operations. Public agencies are called upon to spend large sums on erosion protection measures to avert further disaster and protect large investments which have encroached upon the beaches.

c. Inventory of the local beach erosion hazard: Beaches in the Planning Area are part of what has been identified as the South Coast littoral cell, which stretches between the Santa Ynez River in Santa

Barbara County to the Point Mugu Submarine Canyon. Between 1856 and 1948, the width of Pierpont Beach advanced almost 1,000 feet. This trend was reversed between 1948 and 1961 when the beach eroded by approximately 300 feet. In 1961, the beach was stabilized by the construction of seven groins between the Ventura Pier and the Harbor. Figure 9 depicts selected historic shoreline changes at beaches in the Pierpont area.

The beach erosion hazard in Ventura includes the shoreline in the vicinity of Seaside Park and the Ventura County Fairgrounds. The shoreline in this area is on an open southerly facing coast and is exposed to severe wave action, especially in winter months. At existing rates of coastal erosion, approximately five feet of land could be eroded away in ten years (McClelland Engineers, 1985). The shoreline is currently somewhat protected by concrete debris blocks and rocks that have been placed at the break in the slope west of the end of the Promenade. East of Seaside Park, the Promenade is protected by a seawall and riprap. This area would be expected to be fairly resistant to erosion.

The Ventura Harbor acts as a major sand trap, collecting sand that is being transported down the coast via littoral drift. This sand accumulation in the Harbor requires periodic dredging of the Harbor entrance to allow adequate passage for even small boats. In the past, there have been brief periods when the Harbor has been virtually closed by sand accumulations at the Harbor entrance. The accumulation of sand in the

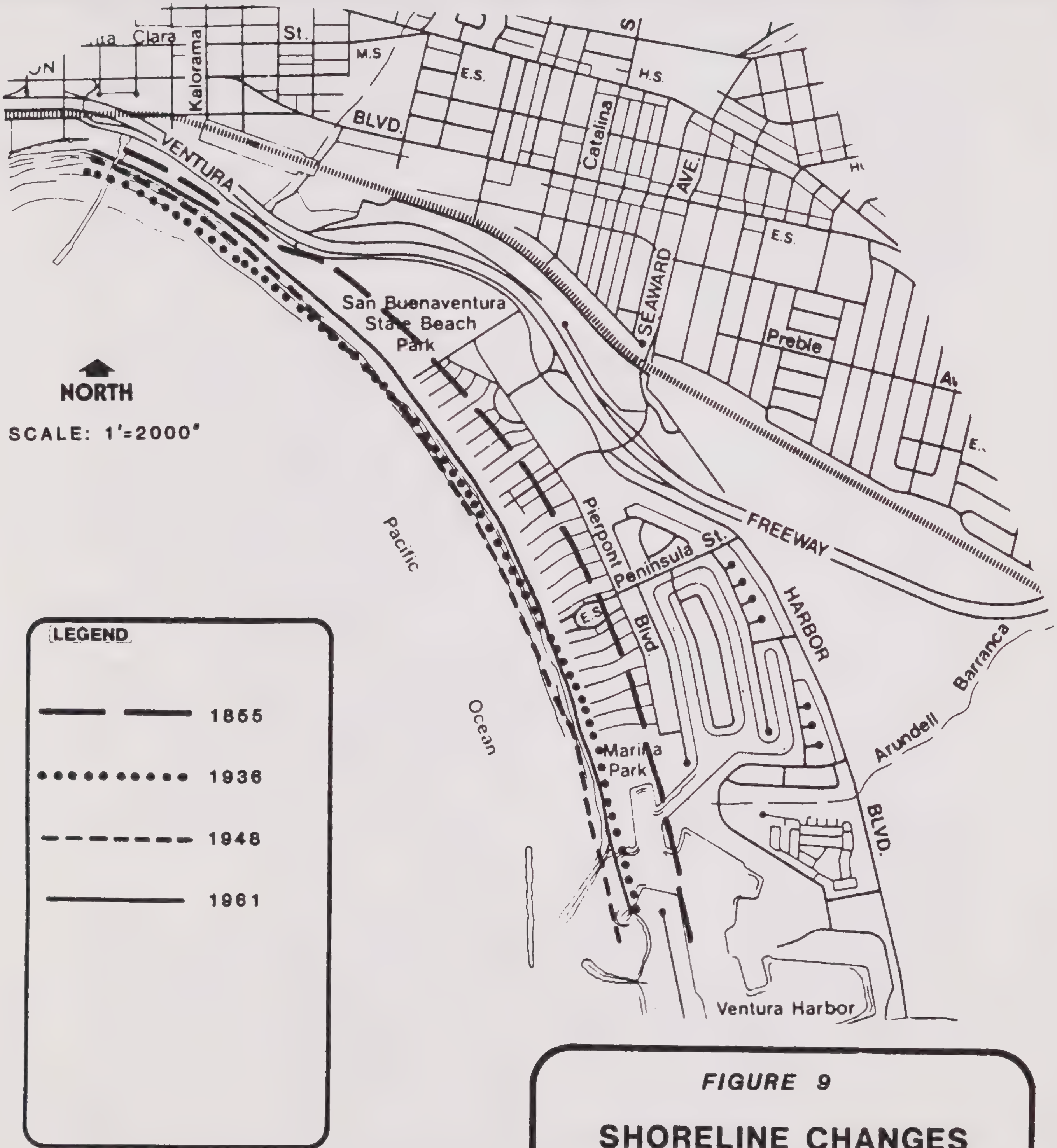


FIGURE 9

SHORELINE CHANGES AT PIERPONT FROM 1855 - 1961

SOURCES: VENTURA COUNTY SEISMIC SAFETY/SAFETY ELEMENT 1974.

Harbor also depletes sand nourishment of beaches located downcoast.

d. Local resources affected by beach erosion: A review of possible shoreline protection measures was conducted in 1985 as part of the Ventura County Fairgrounds Master Plan for redevelopment of the area. Instead of structural protection in the form of a revetment or groin system, a 50 to 100 foot setback from the shoreline by permanent structures was chosen to allow present rates of erosion to continue. The bike path and parking lot in this area are to be maintained within the setback. Without shoreline protection, at current erosion rates the bicycle path will eventually be interrupted with some wave run-up and the parking area will be damaged. Thus, long-term periodic maintenance and repair and alteration of these facilities will be necessary as the natural process of coastal erosion is allowed to continue.

Based upon past history of other areas of Southern California, and as urbanization of the County increases in the future, the general severity of incidences of erosion will also increase.

However, remedial measures taken by proper management of water resources and sand supply, and the future occurrence of major flood flows, could reduce the hazard.

3. Dam Inundation

a. General description: Dam inundation is the flooding of lands due to the failure or overtopping of a dam.

Dam failures can result from a number of natural or man-made causes such as earthquakes, erosion of the face or foundation, improper siting, rapidly rising flood waters, and structural/design flaws.

There are three general types of dams: earth and rockfill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. The earth- rockfill dam will typically fail gradually due to erosion of the beach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete arch or hydraulic fill dam will fail almost instantaneously; thus creating a flood wave which rapidly forms a peak and gradually declines. A concrete gravity dam will fail somewhere in between gradual and instantaneous, with a corresponding build-up of flood wave.

This hazard has more relevance to Ventura County than almost any other area of the State because of the 1928 failure of the St. Francis Dam that caused massive destruction in the Santa Clara River Valley. In California history, this dam failure was the second worst disaster in terms of the number of lives lost; only the 1906 San Francisco earthquake was worse.

Because potential dam failures affect the safety of many communities, inundation maps for all major dams have been prepared by the dam operators pursuant to section 8589.5 of the California Government Code. These maps are a mandatory consideration in the Safety Element. The dam inundation maps were prepared primarily for emergency preparedness plans for

the affected local jurisdictions. Dam inundation is not considered a probable occurrence, because it would be based on a severe hypothetical dam failure due to an unlikely catastrophic event.

b. Effects of dam failure: The failure of a large dam in Ventura County would cause catastrophic flooding, with widespread injury, loss of life and property damage caused by inundation, debris, and sediment deposition. Severe erosion, loss of vegetation and crops, disruption of communication and transportation facilities, utilities and vital public services, and health hazards from ruptured sewage lines and damaged septic tanks are all primary effects of the hazard. Secondary effects include disaster relief, clean-up operations, and repair of public facilities, which place a burden on local and national taxpayers and resources.

c. Inventory of the local dam failure hazard: There are six major dams that could inundate portions of the Planning Area. These dams include Matilija, Casitas, Bouquet, Castaic, Pyramid, and Santa Felicia (Piru). General information and potential inundation areas for each of these dams are discussed below. Potential inundation areas are depicted on Figure 10.

- Matilija Dam. Matilija Dam is located on the west fork of Matilija Creek immediately above Matilija Hot Springs. The dam was completed in 1949 and is of concrete construction. This dam was declared unsafe in 1964. Subsequently, by notching the dam, its capacity was reduced to a maximum containment of 1,800 acre-feet of water.

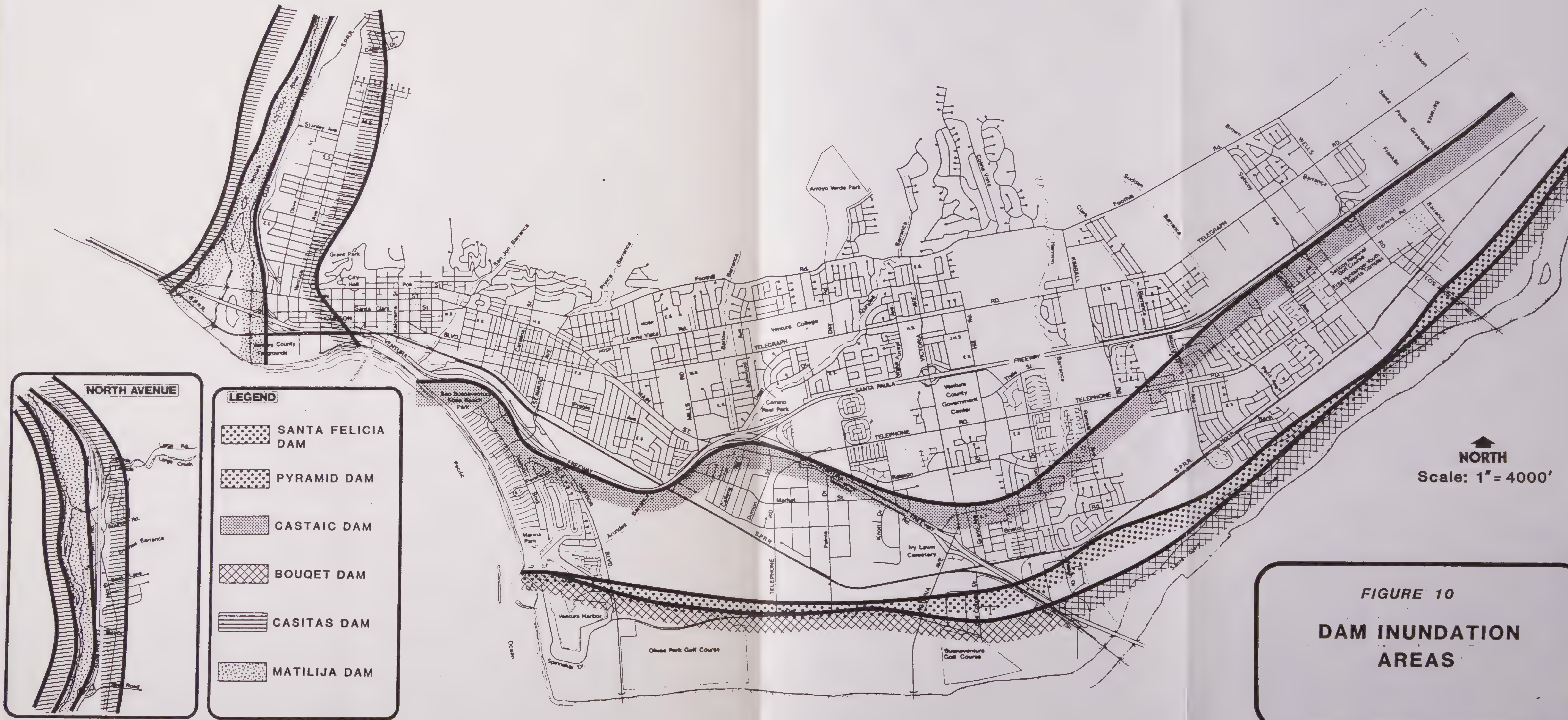


FIGURE 10

DAM INUNDATION AREAS

SOURCES: CITY OF SAN BUENAVENTURA EMERGENCY PREPAREDNESS PLAN, 1986

Should the Matilija Dam fail, the inundation areas in the Planning Area would be confined to the Ventura River bed. The time from dam failure to arrival of peak water near the City would be slightly more than one hour.

- <u>Casitas Dam</u>. Casitas Dam is located on Coyote Creek west of Casitas Springs. The dam was completed in 1959 and is of earth fill construction. At capacity, the dam impounds 254,000 acre-feet of water. Should the Casitas Dam fail, the inundation areas of the Planning Area would include most areas of the Ventura River Valley including development in the Ventura Avenue area and the western portion of the downtown area. The time from dam failure to arrival of peak water at Shell Road would be 47 minutes.

- <u>Bouquet Dam</u>. Bouquet Dam is located adjacent to Bouquet Canyon Road, approximately 17 miles north of the Santa Clarita Sheriff's Station in the Valencia area of Los Angeles County. The dam is actually comprised of two earth-filled dams, one on Cherry Creek and the other on Bouquet Creek. At capacity, these dams impound 36,505 acre-feet of water in a common body. Should the Bouquet Dam fail, the water released would enter Ventura County through the Santa Clara River. The inundation areas in the Planning Area would occur immediately north of the Santa Clara River bed to Olivas Park Drive, including the Ventura Harbor. Limited population and some agricultural and industrial development in the City would be affected. The

time from dam failure to arrival of peak water near the City would be approximately four hours.

- <u>Castaic Dam</u>. Castaic Dam is located on Castaic Creek one mile northeast of the town of Castaic in Los Angeles County. The dam was completed in 1973 and is of earth fill construction. At capacity, the dam impounds 325,000 acre-feet of water. Should Castaic Dam fail, the water released would enter Ventura County through the Santa Clara River. The inundation areas in the Planning Area would be north of the Santa Clara River bed to the Santa Paula Freeway west of Kimball Road; east of Kimball Road the inundation would continue parallel to the river southwesterly to U.S. Highway 101, inundating all areas in the City south of the Freeway to Sanjon Road. The time from dam failure to arrival of peak water flows near the City would be approximately three hours.

- <u>Pyramid Dam.</u> Pyramid Dam is located on Piru Creek, 15 miles north of Castaic in Los Angeles County. The dam was completed in the 1970s and is of earth and rock fill construction. At capacity, the dam impounds 179,000 acre-feet of water. Should Pyramid Dam fail, the water released would enter Ventura County through Piru Creek, possibly combining with the water in Santa Felicia (Piru) Dam, and continuing to the Santa Clara River. The inundation areas in the Planning Area would be immediately north of the Santa Clara River bed and south of the SPRR tracks, east of Victoria Avenue. West of

Victoria Avenue, east, the inundation would generally be south of Olivas Park Drive to Telephone Road where it would extend northward to inundate the Ventura Harbor. The time from dam failure to arrival of peak water near the City would be approximately 2 hours and 15 minutes.

o Santa Felicia (Piru) Dam. Santa Felicia (Piru) Dam is located on Piru Creek, five miles north of the town of Piru. The dam was completed in 1955 and is of earth fill construction. At capacity, the dam impounds 100,000 acre-feet of water. Should Santa Felicia (Piru) Dam fail, the water released would flow down Piru Creek to the Santa Clara River. The inundation areas in the Planning Area would be north of the Santa Clara River bed following the same general extent as the Pyramid Dam inundation area and would affect populated and developed portions of the City. The time from dam failure to arrival of peak water near the City would be approximately two hours.

d. Local resources potentially affected by dam failure: The dam inundation maps prepared by the dam operators are intended as a worst case scenario for use by local agencies for emergency preparedness in the event of unlikely disaster causing dam failure. Although such a catastrophic event is in the realm of possibility, it is not considered likely.

Resources in the inundation zones of the Bouquet, Castaic, Pyramid, and San Felicia Dams include

limited residential population, and commercial, industrial, and agricultural areas immediately north of the Santa Clara River, including the Ventura Harbor. Property damage would occur, but loss of life could be avoided with evacuation within the expected minimum 2-hour time delay from dam failure to inundation.

Resources in the Casitas and Matilija Dams inundation zones include substantial residential population and commercial, industrial, and agricultural areas along Ventura Avenue in east and south Ventura, and the Ventura Harbor and coastal areas. The 47-minute time delay for the Casitas Dam and the 1-hour time delay for Matilija Dam would put large numbers of people at risk if evacuation could not be immediate. Property damage would be unavoidable in the event of a complete failure of the Casitas or Castaic Dams, and the accumulated loss and cost of repair or rebuilding would be substantial.

D. FIRE HAZARDS

The public is exposed to fire from two potential sources: urban fires and wildland fires. The potential risk from these hazards is described below.

1. Urban Fires

a. General discussion: Fire suppression and prevention services in the City are provided by the City Fire Department. In 1986, the Fire Department was comprised of 82 members: the Fire Chief and 4 Assistant Chiefs, 15 Captains, 18 Engineers, 39 Firefighters, and 5 Civilian support personnel. The Fire

Department's 1987 equipment inventory consists of the following apparatus:

- o Five 1,500 gallons per minute (gpm) front-line pumpers
- o Five 1,250-1,500 gpm reserve pumpers
- o One 102-foot aerial ladder truck
- o One 65-foot aerial ladder truck
- o One 85-foot snorkel
- o One 2,500-gallon tank truck
- o Three pick-up trucks
- o Seven squad cars
- o One hazardous material trailer
- o One fire boat
- o One 1919 American LaFrance Type 10 pumper

The above personnel and equipment are distributed throughout the City's five existing fire stations. These stations are located throughout the City (see Figure 11) in the following locations:

FIGURE 11. KEY

Areas of Potenital High Loss of Life from Fires

1. El Portal
2. De Anza Apartments
3. Vista Del Mar Hospital
4. Elms
5. Ventura Hotel
6. Leewood Hotel
7. Midwick Apartments
8. City Hall
9. Masonic Temple
10. Elks Lodge
11. Library
12. Holiday Inn
13. Fairgrounds
14. Santa Clara Guest Home
15. La Siesta Guest Home
16. Terrace Theater
17. Ventura High School Theater
18. Ventura County Medical Center
19. Community Memorial Hospital
20. General Hospital Building 1572 (Rest Home)
21. County Government Center
22. Fox Theater
23. Ventura Town House
24. Library
25. Mound Rest Home
26. Ventura Convalescent Center
27. College Theater
28. California Convalescent Center
29. Buena High School Theater
30. Buena Vida
31. Juvenile Hall
32. Century Theater
33. Harbortown Resort
34. Double Tree
35. Mann Theater 6

Areas of Potential Large Property Loss Fires

1. Kinko's Corporate Offices
2. Downtown Area
3. Borchard Shopping Center
4. Kimball Shopping Center
5. Buenaventura Shopping Center
6. Victoria Shopping Center
7. Marina Center
8. Central Shopping Center
9. Ventura Coastal Lemon at Vista Del Mar
10. Ventura Coastal Lemon building at Montalvo-Valentine Road
11. Saticoy Lemon Association Montalvo-Bristol Road
12. Holiday Inn
13. K-Mart Center
14. East Main Area
15. Callens Road Area
16. Ashwood-College Square Center
17. Financial Institutions
18. Ventura County Medical Center
19. Community Memorial Hospital
20. Women's Center
21. Ventura Co. Government Center
22. Palma Drive Area
23. Ventura Town House
24. Mission Plaza Shopping Center
25. Main Street-Telephone Road Shopping Centers
26. Ventura Keys

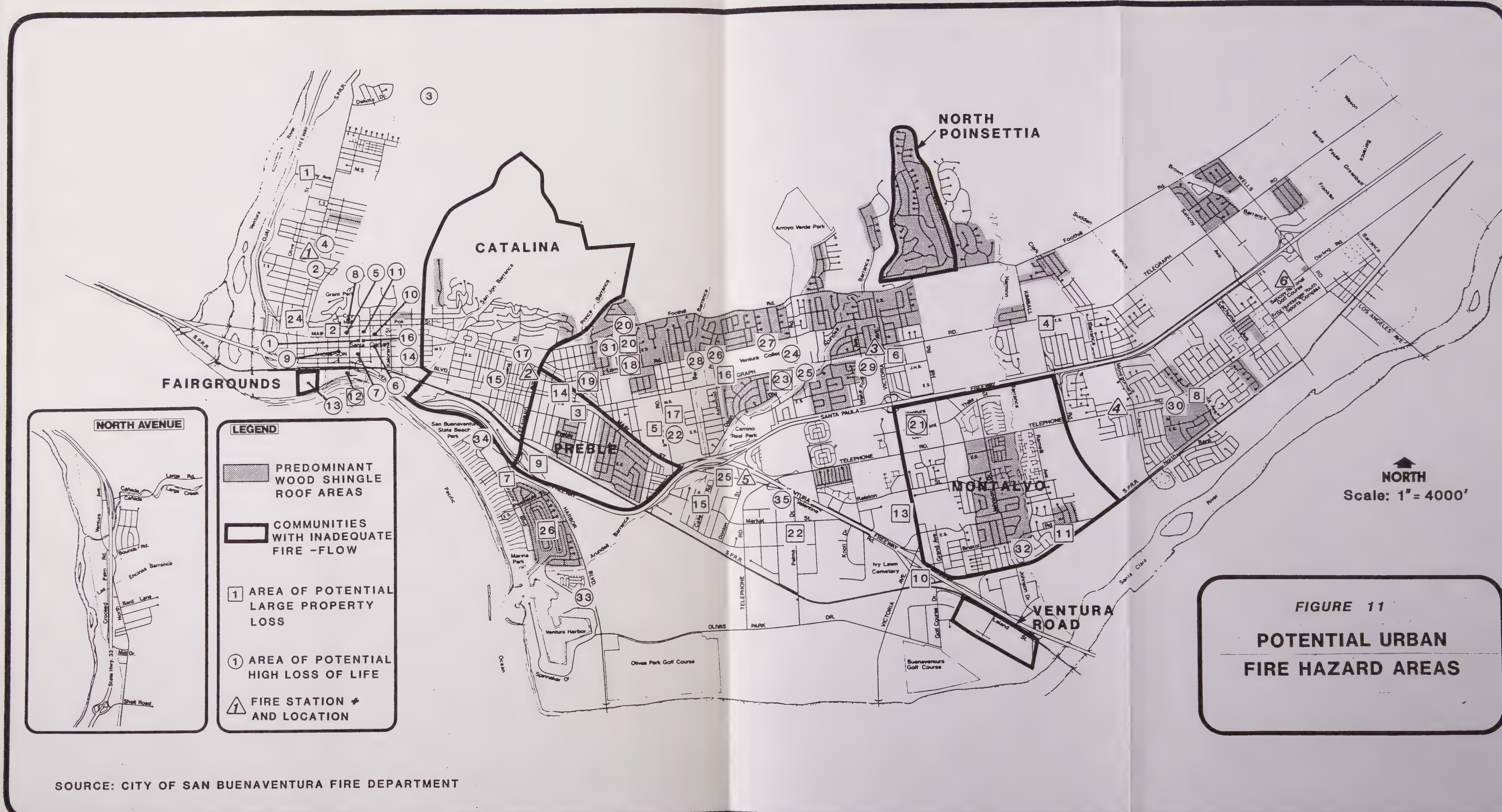


FIGURE 11

POTENTIAL URBAN FIRE HAZARD AREAS

SOURCE: CITY OF SAN BUENAVENTURA FIRE DEPARTMENT

- Station No. 1 Ventura Avenue and Ramona Street. This station was constructed in 1978. The average response time for emergency calls from this station averages 4.08 minutes. In 1989, responses from Station No. 1 comprised 28% of the total City-wide requests for assistance.

- Station No. 2 - Seaward Avenue (just south of Main Street). This station was constructed in 1952 for the then "new" eastern commercial and residential areas of Ventura. The average emergency response time for this station is 4.34 minutes. In 1989 responses from Station No. 2 represented 28% of the City-wide requests for assistance.

- Station No. 3 Telegraph Road (just west of Victoria Avenue). This station was constructed in 1958 to accommodate the easterly residential development of the City. The average emergency response time for this station is 4.25 minutes. In 1989, responses from Station No. 3 represented 13% of the total City-wide requests for assistance.

- Station No. 4 Telephone Road near Montgomery Avenue. Constructed in 1964 to accommodate more easterly residential development in the City this station has an average emergency response time of 5.41 minutes. Responses from Station No. 4 represent 11% of the total City-wide requests for assistance.

- o <u>Station No. 5 - Main Street at Donlon Street</u>. Constructed in 1977 to accommodate the industrial/commercial growth of the East Main Street area, the average response time for this station in 1986 was 4.50 minutes. Responses from Station No. 5 represent 14% of the total City-wide requests for assistance.

- o <u>Station No. 6 - Darling Road</u>. In an effort to provide additional fire protection services for eastern San Buenaventura, and to reduce average emergency response times from Station No. 4, the City has purchased an abandoned County fire station located on Darling Road between Saticoy Avenue and Wells Road. This station is known as Station No. 6. The average emergency response time for this station is 5.0 minutes. Responses from Station No. 6 represent 6% of the total City-wide requests for assistance.

b. <u>Need for new or upgraded facilities</u>: The Fire Department's goal is to ensure equal emergency response times to all areas of the City, with an average response time to emergency calls occurring within four minutes. The measurement of response time is not entirely related to the distance between the fire station and the response locations. Traffic conditions and emergency ingress and egress capability can also influence response times. To more accurately document actual travel times within a particular fire station's response area, actual test runs of fire equipment throughout the City have been conducted. These tests indicated that the present locations of

Stations 3 and 4 do not always provide optimal response times within their response areas.

- <u>Station No. 3.</u> Due to its location near the intersection of Telegraph Road and Victoria Avenue, emergency egress from this station can be delayed by automobiles that stack up on Telegraph Road from the Telegraph/Victoria intersection and block the fire station driveway. In the past, this situation has been significant enough to warrant the eventual relocation of the station. Because the relocation of this station would be in response to station ingress/egress difficulties, and actual response times within the station's area of responsibility, a new station location east of Station No. 3 would be appropriate. In addition, this station is outgrowing its ability to accommodate modern fire apparatus in terms of size. The Fire Department has identified the area on Telegraph Road, east of the existing station as a possible location for a new station. The timing of the relocation of Station 3 should coincide with planned development in the Juanamaria Community and the capital improvements associated with that development.

  As an interim measure to station relocation, the Fire Department has installed a new traffic signal preempt system to improve emergency ingress and egress. A signal preempt system provides adequate station ingress and egress on a temporary basis.

- <u>Station No. 4</u>. Recent commercial and industrial development in the Johnson Drive/U. S. Highway

101 area, combined with the 1980 annexations in the Montalvo area, have resulted in an expansion of the Station No. 4 service area that does not always permit station responses within acceptable time parameters. Because development of the Johnson Drive/U. S. Highway 101/Montalvo area will be likely to continue, additional fire protection to this area will be required. This additional protection could be provided by relocating Station No. 4 closer to this area. No potential relocation areas for the fire station have been identified.

- New fire stations. As development continues to occur in the Pierpont, Keys and Harbor areas of the City, the demand for fire protection services for these areas will increase. Emergency response times to these areas are not acceptable at this time. However, the number of requests for service does not warrant construction of a new station at this time. As new development intensifies, it is anticipated that an additional fire station (Station No. 7) will be necessary to ensure equal emergency response times to these areas. No potential time frame for construction or sites for the new fire station have been identified.

- Fire station structural analysis. Fire stations are critical facilities that must be in good working order after an earthquake or other disaster to prevent additional loss of property and life. Station Nos. 2, 3, and 4 were constructed in 1952, 1958, and 1964, respectively, when

building codes did not require today's stringent structural requirements to resist earthquake damage; therefore, these older fire station buildings may be subject to unacceptable amounts of earthquake damage. Although no building should be considered earthquake proof, Fire Station Nos. 1 and 5 were constructed in the late 1970's and have incorporated newer and much more significant structural features to resist possible earthquake damage.

To assess possible structural deficiencies that may exist at Station Nos. 2, 3, and 4, a structural engineering evaluation of these structures and an assessment of their ability to withstand an earthquake has been conducted. This engineering analysis concluded that earthquake related structural improvements can potentially be made to each of the stations evaluated in a cost effective manner. This evaluation report also concluded, however, that it would not be economically feasible to upgrade these structures to ensure that the stations will remain operable after a strong earthquake. The rehabilitation of these types of structures is discussed further in Section II-1 (Acceptable Risk) in this Element.

c. Inventory of the urban fire hazard: Between 1982 and 1986, the number of calls received for Fire Department services increased from 4244 to 5247 (24%); however, during the same time period, the City experienced an 11% decrease in actual fire suppression calls. The continuing decline in the number of fire

responses is credited to fire prevention activities, the installation of smoke detectors, fire retardant roofing and sprinkling ordinances, and the support and assistance from local citizens.

The increase in total Fire Department responses is the result of a steady increase in non-fire related calls, such as medical emergencies (heart attacks, illness, injury aid, assistance to the elderly/invalid, etc.) and service calls (electrical hazards, hazardous material leaks or spills, rescues, wash-downs, etc.). Between 1982 and 1986, non-fire responses increased from 3277 to 4826 (47%).

d. Local resources affected by urban fire hazard: The risk of life or property loss resulting from fires in urban settings is influenced by a variety of factors. Some of these include building construction materials, the type of occupancy, and items stored within the structure, fire response time, the availability of adequate fire flows of water and adequate emergency ingress and egress. The degree of fire hazard risk will vary throughout different locations in the City. For instance, residential neighborhoods with large concentrations of houses with wood shingle or shake roofs are at a greater fire risk than ones where the majority of the residences utilize fire retardant roofing material. Figure 11 depicts areas throughout the City having concentrations of residences with wood shingle/shake roofs.

Another high fire hazard risk area of the City is the hillside and canyon areas above Foothill Avenue. As residential development is extended into these areas,

the risk of potential loss of life and property will increase. This increased risk results from a variety of factors that are unique to hillside/canyon development, including:

- Structures in the hillside/canyon areas are frequently located adjacent to or within grassland, chaparral or coastal sage scrub plant communities that can create an extreme fire hazard, particularly in summer months (see Section D.2, Wildfires).

- Hillside/canyon development is frequently located away from the urban center areas where fire protection services are located. Therefore, fire station response times to these outlying areas are often longer than optimal.

- Access to hillside/canyon areas is frequently along steep, narrow, or winding roads that can hinder Fire Department access. This can seriously affect response time due to the increased time it takes heavy apparatus to climb steep streets.

- Hillside locations often have marginal or inadequate fire flow capabilities that can hinder fire protection efforts.

As residential development increases in any neighborhood, a corresponding increase in Fire Department service calls will also occur. This is particularly significant in the hillside/canyon areas due to the longer distances between the fire station to the

response location. As service request calls to outlying areas increase, more time exists before emergency response personnel and equipment are removed from the central urban areas. This results in a temporary shortage of fire suppression/emergency response capabilities in the more highly urbanized areas. To accommodate for this, other fire stations are required to respond to calls outside of their normal service areas, thereby increasing response times.

Inadequate fire flow (water available to fight a fire) can also hamper the Fire Department's success in suppressing a fire. Areas in the City that have been identified as needing future improvement to fire flow capabilities include:

- Ventura Road

- Ventura County Fairgrounds

- Portions of the Preble, Montalvo, and Catalina communities where four-inch water mains still exist

- North end of the Poinsettia community

As discussed previously, the trend over the last five years has been a decrease in structural fires and an overall decrease in fire responses compared to non-fire responses by the City Fire Department. Continued fire prevention efforts, such as public education and City ordinances to reduce the fire hazard, will contribute towards a reduction of the

incidence of Fire Department responses, especially structural fires. As the population of the City increases, non-fire responses, particularly emergency medical/rescue service, are likely to represent a larger portion of the calls for Fire Department service.

The urban fire hazard can be reduced through continued public awareness of fire prevention techniques and enforcement of the Uniform Fire Code, and other City ordinances that regulate construction standards, fire flow requirements, minimum road widths, subdivision design, and maximum cul-de-sac lengths for adequate fire protection. Conducting weed abatement and brush control around structures on a regular basis also reduces potential fire hazards. Adequate evacuation signing and regular fire drills in structures with large numbers of people would also reduce the fire hazard.

2. Wildfire

a. General description: Rugged hills and mountains border the City to the north. There the hills are covered mostly with grasses, brush, and scattered oaks at the low elevations. The climate in this area is generally referred to as Mediterranean in nature with rainfall concentrated during the cool winter months. The rains usually stop sometime in May and a drought often lasts into November. The summer drought is the dominant characteristic of the climate and causes vegetation to become dangerously dry. These characteristics make the Hillside Area of the Planning Area a hazardous fire area.

A local variation that aggravates the already hazardous fire situation is a regional weather phenomenon that often occurs in southern California when a low pressure trough develops off the coast and high pressure settles over the Great Basin of Nevada and Utah and over the deserts of eastern California and Arizona. The normal westerly wind flow is reversed and air pours in from the north and east, out of the deserts, down into the coastal basins and valleys. These are the Santa Ana winds that funnel through the mountain passes, growing warmer by compression as they descend. The winds arrive hot and dry. They are charged with static electricity and carry dust. The extreme dryness, down to one percent or less relative humidity, desiccates the vegetation already dried by the drought. The potential for a severe wildfire to occur is increased further when dense vegetation growth and large accumulations of dead plant material are present. This situation can be created when a brush area has not been burned for many years, and the percentage of dead plant material makes up a large portion of the total vegetative growth present. Steep terrain can also serve to compound wildfire risk, as fires will normally burn much faster uphill.

Rugged terrain will also hinder fire suppression attempts by hampering the mobility and effectiveness of firefighters and equipment.

Severe weather conditions, dense vegetation, and steep terrain can all create a hazardous wildfire potential, but not cause wildfires. It has been

estimated that over 90% of all wildfires are caused by human carelessness. Other estimates show that over one-third of all wildland fires originate alongside roads and highways, probably as a result of cigarettes or matches being thrown from passing automobiles. Despite rising penalties, approximately 22% of all fires recorded State-wide result from the act of arson.

High voltage power-line failure is another potential source of wildfires. Approximately 23% of all the wildfires that burn over 5,000 acres are caused by power line failure. Other causes of wildfire include such activities as debris burning and machine use (i.e., off-road vehicles, construction equipment, and other power-driven equipment used in industry, agriculture, and recreation). Potential increases in the frequency of wildfires may also be caused through housing development, hiking trails, etc. Wildfires also originate in developed areas, as children playing with matches, bonfires, burning rubbish, sparks from chimneys, and fireworks are often cited as sources of wildfire. Natural causes, primarily lightning, are now relatively minor causes of local fires.

Wildfires in Southern California are a natural, recurring, necessary event. Native vegetation has developed adaptations to survive repeated burning and has, in fact, grown dependent on it. Some species of plants must be burned regularly or they will become senescent and die after about 50 years. The reasons for this are not well understood, but in some cases toxic chemicals produced by the plants may reach con-

centrations in the soil higher than the plant can tolerate.

To survive these frequent burnings, many chaparral plants have developed adaptations that allow them to grow back quickly after a fire. Such adaptations include a root system that can tolerate extreme heat and quickly resprout, and seeds that require extremely high temperatures before germination can occur.

Responsible public agencies in California and Ventura County have developed elaborate systems for fighting brush fires. When weather conditions become severe, all firefighting personnel are put on alert. When a fire starts, all available personnel are rushed to the scene to keep the fire from developing into a major blaze. If the fire does get out of control and more than the City's own resources are required, mutual aid agreements are in effect with neighboring cities, counties, State and Federal agencies (i.e., California Office of Emergency Services and U. S. Forest Service) to send additional aid.

b. Effects of the hazard: Immediate losses resulting from wildfire generally have the most impact on the natural environment. Although some ecosystems are dependent upon recurrent fire to survive, these communities are unique. Damage to man-made structures usually accounts for most of the monetary losses caused by wildfires. Other losses result from the immediate fire suppression costs, and loss of water shed, wildlife, recreation areas, and public service facilities such as telephone and electrical lines.

Wildfires can also jeopardize the lives of residents in its path and of the firefighters.

After the fire has been extinguished, the burned land is laid bare of its protective vegetation cover and becomes susceptible to excessive run-off and erosion. The fire will often destroy the root systems of shrubs and grasses that aid in stabilizing slope material. When the winter rains come, the possibility of severe landslides and mudslides is greatly increased.

Public utilities are often strained by the impacts of wildfire. Water reserves are depleted, power lines are downed, telephone service can be disrupted, roads can be blocked, etc. Flood control operations may be affected by an increase in storm run-off, sediment and debris, resulting from barren burned-over hillsides.

c. Inventory of the local wildfire hazard: Fires have burned through various areas of Ventura County virtually every year for which records are available, and probably for centuries before that. The largest fire in the County and the State's history burned 219,000 acres, mainly in the Sespe and Matilija Canyon of Los Padres National Forest in 1932.

The Creek Road Fire in 1979 burned 32,000 acres in the hills north of the City, but did not affect the Hillside Area of the Planning Area. The last fires in the hills directly north of the City were the 1956 Sexton Canyon Fire and the 1970 Foothill Fire, which burned homes within the City limits. The County Fire Department considers this area to be "overdue" for a

wildfire and is conducting a prescription burning program to modify the age class of the vegetation to reduce the incidence of wildfire in the area (Wright, personal communication, 1987). A prescribed burn was conducted in December, 1986, in the hills north of the City and the County Fire Department plans to conduct further prescribed burns.

In general, wildfire hazard exists in the hillside and canyon areas north of the City that are covered with natural vegetation. This high wildfire hazard area encompasses much of the area north of Poli Street/Foothill Avenue and east of Ventura Avenue (see Figure 12). Hillside developments within natural brush areas are particularly susceptible to destruction in wild fires. Although the Sexton Canyon Fire in 1956 fortunately did not burn any homes, the Foothill fire in 1970 destroyed 12 structures, and many more could have been damaged or destroyed by the fast moving flames.

d. <u>Local resources affected by the hazard</u>: The only existing critical structures located in the high hazard area are Edison Company distribution lines and transmission station, and oil production and storage facilities. Numerous residential areas are, however, in and adjacent to the hazardous wildfire area and could be exposed to wildfires and related damage. These include the residential developments located on and adjacent to hillsides in the Poinsettia, Arroyo Verde, Catalina, Downtown and Avenue communities.

The seriousness of a wildfire is dependent upon the conditions present at the time of fire occurrence.

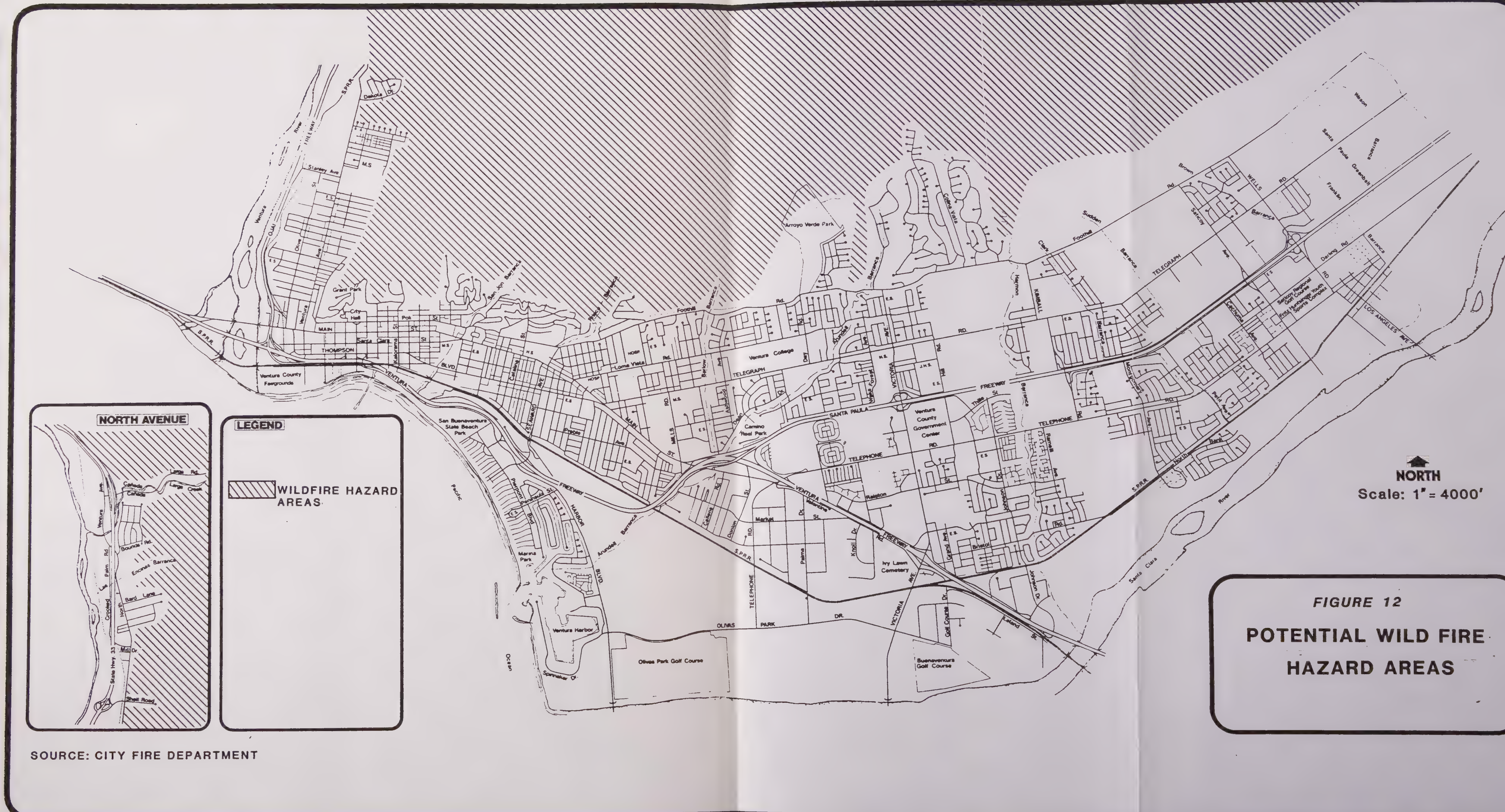


FIGURE 12

POTENTIAL WILD FIRE HAZARD AREAS

SOURCE: CITY FIRE DEPARTMENT

The most hazardous conditions that would threaten the Planning Area occur during periods of low humidity and elevated temperature. These conditions are accompanied by the dry, strong north/northeast Santa Ana winds common in the fall and early winter months that push the wildfire downslope into the developed portions of the City. The hillsides and canyons north of the City are covered with vegetation of a light to moderate hazard. During the periods of high winds and/or low humidity, however, a fire burning in this vegetation can pose a grave threat to persons and structures.

E. HAZARDOUS MATERIALS

More than 60,000 chemical substances are manufactured in the United States for use in an almost unlimited number of products. The benefits derived from such extensive use of chemicals are significant; however, the mismanagement of these substances can cause severe health, safety, and environmental damage. Many of these chemicals are commonly used in day-to-day activities, and include such common items as paints, solvents, fuels, acids, cleaning agents, pesticides, and herbicides.

An estimated 1,400 manufacturing and 6,000 commercial establishments throughout Ventura County utilize hazardous materials and generate hazardous waste (Ventura County Solid Waste Management Plan, 1985). Many of these hazardous material users and waste generators are located in the Planning Area. Typical users of hazardous materials and hazardous waste generators include agricultural-related uses, oil extraction and service industries, electronic manufacturing, automobile service stations,

dry cleaners, repair shops, chemical warehouses, and most types of manufacturing or assembly industries.

The growing public concern regarding the use and mismanagement of hazardous materials has prompted the passage of numerous Federal, State, and local regulations regarding the use, storage, transportation, handling, processing and disposal of hazardous materials and waste. The goal of many of these regulations is to assure adequate "cradle to grave" control (i.e., tracking hazardous materials from generation to proper disposal) of hazardous materials and waste.

Between 1978 and November 19, 1980, most of the hazardous waste generated in Ventura was disposed of at the Simi Valley Class I landfill. Since the closure of the Class I portion of the facility, hazardous wastes have been disposed of at the Casmalia (Santa Barbara County) or Kettleman Hills (Kings County) Class I disposal facilities or have been sent to be recycled.

Improper use, storage and disposal of hazardous materials and waste can result in surface and groundwater degradation, air pollution, fire, explosion, and poisoning of wildlife, livestock and humans. Many of the hazardous materials that are commonly used in households and by industry have been linked to increased occurrences of cancer, birth defects, reproductive failures, and other irreversible effects. Hazardous material spills and leaks, or the clean-up of illegal waste disposal sites can result in the expenditure of substantial amounts of public funds, as well as create a potential public health hazard.

1. <u>Inventory of the Local Hazard</u>

In response to the requirements of the State's Chemical Disclosure Laws, the City Fire Department has been designated as the administering agency for the City to implement this legislation. The purpose of this legislation is to provide accurate information at all times regarding the location, type, approximate quantity, and health risk of hazardous materials on waste to emergency response personnel, the public and other government officials. As the administering agency, the Fire Department compiles and maintains a list of companies and individuals that utilize minimum amounts of specified hazardous material and generate minimum quantities of hazardous waste. This list should be consulted for an up-to-date reference of hazardous material users/waste generators in the City. Many of the businesses that handle or store hazardous materials and waste are located in the industrial areas of the City that have been designated by the Comprehensive Plan and Zoning Ordinance for industrial uses. The risk of accidental exposure to hazardous materials is, therefore, reduced somewhat because structures are designed and built to accommodate these hazardous materials and occupancies. An area of general concern among emergency response officials is the proliferation of "assembly" type occupancies (i.e., churches, theaters, day care centers, etc.) located in industrial buildings. The location of these assembly occupancies in industrial areas increases the risk that large numbers of people may be potentially exposed to hazardous materials, either on a day-to-day basis or during an accidental release/upset condition. This risk of accidental exposure is greatest when hazardous material or use and assembly occupants are located in the same multi-tenant structure.

The use of chemicals and hazardous materials in every day agricultural, industrial, commercial and household applications has become standard practice. It is not reasonable to assume that the use of hazardous materials and the generation of hazardous waste will be discontinued. Therefore, potential health, safety, and environmental risks will continue to occur.

2. Regional Planning Programs

In response to the State's requirements, the County of Ventura has prepared a Hazardous Waste Management Plan. This Plan provides long-range projections for hazardous waste volumes, and to determine recycling, treatment, transfer and disposal facility needs. The Plan also provides siting criteria and general geographic locations for needed new facilities.

The County Hazardous Waste Management Plan must be approved by a majority of the cities in the County that have a majority of the incorporated population. This is now occurring. Once adopted the Plan must be amended into the Comprehensive Plan or enacted by City ordinance to ensure that all future land use entitlements are consistent with the Plan.

F. STRUCTURAL HAZARDS

Any type of structure, if inadequately designed or constructed to withstand the expected intensities of earthquake generated ground shaking, may experience severe damage or complete collapse during a strong earthquake. It is currently economically infeasible, using state-of-the-art construction techniques, to build a totally earthquake-proof structure. Therefore, a

certain level of risk is inherent regarding structural safety. Because a structure's performance in a strong earthquake is closely related to its construction characteristics, this level of risk can be reduced to an acceptable level by using the appropriate building materials and techniques.

Different construction materials have varying strength values and will consequently react to the earthquake forces differently. The shape of a building and the geometry of the earthquake resisting frames can also have a considerable influence on the amount of damage suffered by a building during an earthquake. These and other characteristics will combine to determine the fundamental period of the structure, which is a main factor in determining the oscillation level or degree and type of shaking to which the structure is subject.

Although all structures exhibit unique response characteristics to strong earthquake-related ground shaking, certain types of buildings with different building materials will have a tendency to react in a similar manner. Listed below is a brief summary of some of these earthquake response characteristics.

- Wood frame buildings. Small one and two story wood frame structures have withstood the effects of ground shaking quite well. These buildings are practically uncollapsible because of their flexibility and light weight. Large wood frame buildings of two or more stories may be badly damaged during an earthquake, but usually do not totally collapse. Unfortunately, wood frame buildings are fire prone. In some past big earthquakes, most wood frame buildings have survived the earthquake, but have been destroyed by post-earthquake fires.

- Steel frame. These buildings are also very flexible structures and will usually survive ground shaking quite well. During an earthquake they may be damaged, but unless ground rupture occurs beneath them, they generally will not totally collapse. Braced structural steel buildings are less flexible, and if they lose the bracings, may collapse.

- Reinforced masonry buildings. When properly designed and constructed, reinforced masonry structures can survive earthquakes. However, they are brittle, and in strong quakes may crack or collapse. Improperly poured or poor quality concrete will considerably increase the possibility of building failure.

- Unreinforced masonry. This includes such building materials as unreinforced concrete and brick, hollow concrete block, clay tile, and adobe. Buildings constructed from these materials have little earthquake resistance. They are heavy, brittle buildings; in small earthquakes they can crack, and in stronger quakes they have a tendency to collapse. These types of structures pose the largest structural hazard to life and safety of all general building types.

Non-structural items and building components can also influence amounts of damage suffered during an earthquake. Unreinforced parapets and chimneys, facades, signs and building appendages can all be shaken loose during an earthquake, creating a serious risk to life and property.

1. Effects of the Hazard

The primary effect of hazardous structures in the community is the potential for the loss of life and property. During an earthquake, damage to a structure can range from superficial damage to complete and total collapse.

Structural failure can also lead to the disruption of transportation, communication and power systems, all vital to emergency response. The loss of structures that house vital or critical facilities after a major disaster will seriously hamper emergency rescue operations.

2. Inventory of the Local Structural Hazard

Many of the structures in the City that were built around the turn of the century and through the early 1900s are still standing. Many of these are unreinforced masonry or adobe structures, and some have been designated as historic structures. The absence of a severe earthquake and ground shaking occurrences in the Planning Area has resulted in a relatively benign environment for these structures, because their structural integrity to resist severe ground shaking has not been tested by actual severe ground movement.

In an effort to locate and document the existence of unreinforced masonry structures, the City Building and Safety Division has conducted a City-wide building survey. This survey indicated that approximately 172 unreinforced masonry structures are located throughout the City. However, most are concentrated in the Downtown community. The Building and Safety Division maintains this map of unreinforced masonry structures and keeps it up-to-date by recording when these structures are either upgraded or removed. This map should be consulted for information

regarding the location of unreinforced masonry structures located in the City.

To reduce the potential life and safety hazards created by the presence of unreinforced masonry structures, the City is considering the adoption of a hazardous structure abatement ordinance. An ordinance could typically outline two levels of hazard abatement. For example, Level one protection could require building modifications that would reduce potential life and safety risks to an acceptable level. This level of protection would not ensure that a structure would be usable after a major earthquake, but would reduce the potential risk of total building failure to an acceptable level. Level two protection could require modifications that would strengthen a building such that it would likely be usable after a strong earthquake. The drawback to the implementation of Level two improvements is that the required building modifications are typically more than three times the cost of Level one improvements.

II. STANDARDS AND OBJECTIVES

An objective of the Safety Element is to reduce public safety hazard of new development to acceptable levels. To achieve this objective, the following standards have been adopted.

A. ACCEPTABLE RISK

The California Council on Intergovernmental Relations has separated risk into three separate categories:

- Acceptable risk. The level of risk below which no specific action by government is deemed necessary.

- Unacceptable risk. The level of risk above which specific action by government is deemed to be necessary to protect life and property.

- Avoidable risk. Risk not necessary to take because individual or public goals can be achieved at the same, or lower total "cost" by other means.

The concept of acceptable risk may seem difficult to comprehend at first, but this type of risk is actually a part of everyday life. Almost all activities have some degree of risk associated with them, and natural and artificially induced hazards of some degree and kind are almost always present. Efforts can be taken, however, to reduce the consequences of known hazards and associated risks.

It must then be asked, "How safe is safe enough"? There is no uniform level of risk that is acceptable to the general public, and maximum safety is desirable. Minimizing risks, however, usually involves practices that result in higher costs. The

cost of providing protection from a hazard increases proportionately with the level of risk reduction required and severity of the hazard. The cost of each additional increment of protection becomes increasingly more and more expensive, until at some point the cost of providing protection becomes prohibitive when compared to the benefits derived. At this point, the risk becomes acceptable, or the public is no longer willing to pay more to further reduce risk. The decision of when an acceptable level of protection is reached must ultimately be decided upon by the public.

To evaluate what is considered to be acceptable risk the following factors should be considered:

- Severity of potential losses. Seismic or other natural hazard impacts including loss of life, injury, property damage, and loss of function should be considered.

- Risk reduction capabilities. Consideration should be given to current technological capabilities, available fiscal and manpower resources, and established priorities.

- Probability of loss. The probability of future seismic or other adverse hazardous natural occurrences should be evaluated in light of their possible effect on structures or human activities.

- Adequacy of basic data. This is an important factor in estimating the probability of unperceived hazards.

A very real and significant hazard in the Planning Area is the potential for seismically induced ground shaking resulting from movement along a local or more distant major fault and the resultant building damage. Knowing that a major seismic event

will eventually occur, but not knowing when or to what degree the hazard will occur, creates a level of risk. The amount of risk created by potentially unsafe buildings that is acceptable to government officials and the general public must be established and defined. Although many individual factors can be combined to establish an acceptable level of risk, the most widely accepted measure of risk is the amount of money people are willing to pay to reduce the risk.

Because the willingness to pay and the availability of money is usually limited, the most efficient method to implement a hazardous structure risk reduction program is to establish a priority or ranking system that identifies what types of structures and uses represent the greatest risk and what level of risk reduction measures should be implemented. Listed below is a suggested risk reduction priority program.

1. Level 1

   Building modifications to prevent building failure or collapse during a major earthquake:

   - Structures containing critical facilities constructed prior to 1933

   - Structures containing critical facilities constructed after 1933

   - Non-critical structures constructed prior to 1933

   - Non-critical structures constructed after 1933

2. Level 2

- o Building modifications to resist major earthquake damage (i.e., forces anticipated to be associated with a maximum credible earthquake) and to allow continued use of the structure:

- o Structures containing most critical facilities which were constructed prior to 1933

- o All other structures containing most critical facilities constructed after 1933

The City has an on-going program that has mapped the locations of unreinforced masonry structures throughout the City. This is a major first step toward the ultimate abatement of structural hazards in the City.

B. CRITICAL FACILITIES

In the hours immediately following the 1971 San Fernando earthquake in Southern California, emergency services were impaired by damage to police and fire stations, communication networks and utility lines. A number of major hospitals in the area were seriously damaged and were unable to continue functioning when most needed. These and other facilities are vital to the community's ability to respond to a major disaster and to minimize loss of life and property. The experience in San Fernando emphasized the need to provide these "most critical" and "critical facilities" with a higher level of protection from earthquakes than non-critical structures. At a minimum, all structures which could have an effect on the loss of life should be designed to remain standing, even if rendered useless in the event of a major earthquake. "Most critical" facilities should not only remain standing, but should be able to operate at peak efficiency in the event of a disaster. Designing a building to this higher level of seismic safety not only entails a stronger structure, but also requires greater attention to non-structural items such as elevators, lighting, and storage facilities.

The type of facilities considered critical and non-critical is part of the public decision on acceptable risk. The following lists suggested classifications of various types of uses that are either essential for disaster relief operations or may result in unacceptable levels of loss of life or injury.

Category	Facilities
Most Critical	Hospitals, civil defense communications, water supply facilities, fire and police facilities, tele-

	phone communication facilities, electrical substations.
Critical	Schools, theaters, auditoriums, clinics, utility systems, bridges, pipelines, major public areas including shopping centers, parks, convention and conference facilities, rest homes.
Non-Critical	Low-density residential, commercial, industrial, office, and similar uses.

III. PROGRAMS

The following Federal, State, and local programs support the objectives of the Safety Element by reducing public safety hazards within the Planning Area.

A. GEOLOGIC AND SEISMIC HAZARDS

1. Alquist-Priolo Special Studies Zones Act

In 1972, the California Legislature enacted the Alquist-Priolo Special Studies Zones Act. The purpose of this Act is to ensure that structures for human occupancy are not built on active faults by requiring a geological investigation for new development within designated special studies zones. The Act requires the State Geologist to delineate special studies zones around all potentially and recently active traces of major faults in California.

The regulation of the State Mining and Geology Board, which governs the Alquist-Priolo Special Studies Zones, provides that:

> No structure for human occupancy, identified as a project under Section 2621.6 of the Act, shall be permitted to be placed across the trace of an active fault. Furthermore, the area within fifty (50) feet of an active fault shall be assumed to be underlain by active branches of that fault unless and until proven otherwise by an appropriate geologic investigation and submission of a report by a geologist registered in the State of California. This 50-foot standard is intended to represent minimum criteria only for all structures. It is the opinion of the Board that certain essential or critical structures, such as high-rise buildings, hospitals, and schools should be subject to more restrictive criteria at the discretion of cities and counties. Moreover, it is

recommended that a geologic report by a geologist registered in the State of California be required for a single-family dwelling otherwise exempted under Section 2621.6, if that structure lies on or within 100 feet of the trace of a historically active or other known active fault as shown on Special Studies Zone Maps or by more precise or detailed information known to the approving authority." (Title 14, California Administrative Code Section 3602(a))

A special study zone has been designated in the City. This zone is located north of and roughly parallel to Telegraph Road and Main Street. The zone extends from east of Kimball Road on the east side of the City to Ventura Avenue on the west side of the City. The zone varies in width from approximately 1,000 to 2,000 feet and encompasses approximately 918 acres. The boundary of the special study zone is depicted in Figure 1; however, this figure is for reference purposes only. For the precise location of the zone, refer to the official study zone maps published by the California Division of Mines and Geology. All development permits are withheld in this zone until a geologic investigation demonstrates that the site is not threatened by surface displacement from future fault movement.

Most of the properties located in the Alquist-Priolo Fault Rupture Hazard Zone have been developed. The majority of the remaining vacant properties are located in the northeast part of the City, in the Poinsettia and Juanamaria communities. New subdivision and construction (with the exception of structures not used for human habitation or single-family wood frame dwellings not exceeding two stories) must submit a geologic report that delineates any hazard of surface fault rupture.

2. <u>Hillside Management Program</u>

The Hillside Management Program was established by the City to address the unique opportunities and special problems associated with hillside and canyon development. The overall objective of this program is to:

> "... relate the number and distribution of dwelling units in future hillside development to the topographical, geological, and hydrological conditions of the hillsides, so that the terrain will retain its natural and scenic character, and the danger to life and property by the hazards of fire, flood, water pollution soil erosion, and land slippage will be minimized."

The policies, development standards and submittal requirements contained in the Hillside Management Program provides the City Council, Planning Commission, developers and citizens with an overall guide to the future development in the Hillside Area and requires area-wide plans and property specific studies to be conducted.

3. <u>Uniform Building Code</u>

Building construction in Ventura is regulated by the Uniform Building Code (UBC). The UBC is periodically updated by the International Congress of Building Offices and is subsequently amended and adopted by the City. The UBC represents current state-of-the-art in building construction measures to provide for earthquake-resistant structures. The City Building and Safety Division requires that, in conformance with UBC requirements, soil reports be prepared for most new structures used for human occupancy. These soil reports are needed to assess on-site soil conditions for such potential geologic hazards as expansive soils and liquefaction. Soil reports for non-critical facilities are sometimes waived for new construction in the beach area due to the uniformity of

soil conditions found there. For major development projects, such as the construction of critical facilities or uses that will have large occupant loads, geologic investigations are required to assess the potential impacts of earthquake-related ground shaking at the site. New major development in the hillside areas are required to assess the potential for landslides or other potential ground failure.

4. Seismic Sea Wave Warning System

The Seismic Sea Wave Warning System (SSWWS), directed by the U. S. Coast and Geodetic Survey, is the primary source of tsunami detecton. This system has been in operation since 1948. The SSWWS and cooperating foreign countries operate a system of seismographs and tide stations. The purpose of this system is to provide early warning to low lying areas of the approach of tsunamis.

B. FLOODING

1. Federal Flood Insurance Program

The Federal Emergency Management Agency has designated "Areas of Special Flood Hazard" within the Planning Area. The basis of the areas designated is a Federal Flood Insurance Study and Flood Insurance Rate Map (FIRM) that may be periodically amended by the Federal Flood Insurance Administration.

2. Flood Plain Ordinance

In 1986 the City adopted a Flood Plain Ordinance. The purpose of the ordinance is to limit new development within flood plains defined by the Federal Flood Insurance Program. In general, new development on flood plains is limited to agriculture, recreation, and appropriate public facilities. Existing industrial development is permitted to expand to the identified limits of a property's lease area.

3. Regional Beach Erosion Control Group

In an effort to provide regional direction, coordination, and legislative support regarding beach restoration and shoreline erosion programs and projects, the cities of Carpinteria, Oxnard, Port Hueneme, Santa Barbara, Ventura, and counties of Ventura and Santa Barbara have entered into a joint powers agreement to establish the Regional Beach Erosion Control Group (BEACON). The adopted objectives of BEACON are listed below:

- Identify solutions to coastal erosion problems addressed in the Needs Assessment Document and as may be subsequently determined.

- Coordinate the use of local, state, federal and private resources.

- Facilitate design, financing, construction and maintenance of beach restoration and shoreline protection projects.

- Collect and analyze data needed to facilitate the design of projects and to monitor their performance.

- Coordinate local government involvement and keep elected officials and citizens informed.

- Support the preparation of contingency plans by member agencies to be ready in emergencies to direct public and private efforts to combat erosion and to take steps necessary to coordinate the protection of public and private property.

- Spearhead local government lobbying efforts at the state and federal levels.

On a local basis, the City has adopted shoreline protection and bluff development policies as part of the Local Coastal Program which are applied to potential new development that might impact these areas.

C. FIRE PROTECTION

1. Existing Fire Prevention Programs

In addition to fire suppression services, the City Fire Department conducts fire prevention and public education programs. The Fire Prevention Division is responsible for fire investigations, inspections of newly-constructed buildings, storage tanks, and annual inspections of commercial and industrial business establishments. Public education regarding fire prevention and safety, disaster preparation, and fire extinguisher demonstrations are conducted during numerous public programs. In conjunction with the Ventura Unified School District, all fifth graders participate in a Junior Fire Department program.

Other measures that have been adopted by the City to improve fire prevention and suppression are listed below:

- Ordinance No. 5133 - "Smoke Detectors." This ordinance requires the installation of smoke detectors in all dwellings throughout the City.

- Ordinance No. 5132 - "Fire Retardant Roofing." This ordinance requires the use of fire retardant roofing materials (as approved by the Fire Chief) for all new structures located in the City.

- Ordinance No. 5131 - "Automatic Sprinklers." This ordinance requires that all new structures that are over 5,000 square feet in gross floor area be equipped with automatic fire sprinklers.

- "Weed Abatement" Ordinance. This ordinance requires that weed plant species be cleared from all vacant lots and within 100 feet of all structures located in the City. Non-compliance with this ordinance can result in the Fire Department hiring crews to remove the weeds and the cost of the weed removal being assessed on the property owner's property tax bill.

- Ordinance No. 5111 - "Uniform Fire Code." This ordinance adopts and amends the Uniform Fire Code.

In addition to the equipment and facilities listed above, the City has entered into reciprocal automatic aid agreements with the Ventura County Fire Protection District and cities of Oxnard and Santa Paula, the Port Hueneme Naval Construction Battalion Center and the Point Mugu NMTC. The Ventura County Fire Protection District has three

engine companies adjacent to the City of San Buenaventura that can lend the most prompt assistance to the City. These facilities include:

- Engine Company 24. Located off North Ventura Avenue, 2.4 miles from the City limits.

- Engine Company 26. Located on Telegraph Road, 1.6 miles from the City limits.

- Engine Company 51. Located on Vineyard Avenue, 1.5 miles from the City limits.

D. HAZARDOUS MATERIALS

The City Fire Department is the administering agency for the chemical disclosure laws (also known as the "Right to Know" legislation). This legislation requires the implementation of the three basic plans described below.

- Area Plan. This plan is to be prepared by the administering agency to deal with emergency response to releases of hazardous materials.

- Business Plan. All businesses, companies, or individuals that store or utilize hazardous materials or waste must provide a plan and inventory of those materials to the implementing agency. Businesses that handle less than specified minimum quantities of hazardous materials/waste may be exempt from the reporting requirements.

- Inspection Plan. The implementing agency must provide an inspection plan for each business using or storing hazardous material or waste, and must design an information

management system to make the information available to the first responders, government officials and, where requested, to the general public.

To implement the above legislative requirements, the City has adopted Ordinance No. 5510, that also establishes a fee schedule to offset costs incurred with the implementation and enforcement of the ordinance requirements.

The City Fire Department has been designated as the agency with the primary responsibility for response to and coordination of spills and releases of hazardous materials or waste on City streets, or other properties within the City. For any spills or releases that occur on State highways, the California Highway Patrol has the primary response responsibility.

The County of Ventura has developed a regional Hazardous Waste Program. The objectives of the program are to:

- o Ensure that hazardous waste generators handle, treat, transport, and dispose of hazardous wastes in a legal and safe manner.

- o Control abandoned hazardous waste sites to prevent health hazards and environmental damage.

- o Reduce incidences of illegal dumping.

- o Prepare for emergency responses to accidental and illegal hazardous material discharges.

- o Provide comprehensive hazardous waste management planning for source reduction treatment, disposal, and resource recovery of hazardous wastes.

Under State authority, the County Health Officer is authorized to enter and inspect any place or vehicle where hazardous waste is transported, generated, treated, stored, or disposed. The County Health officer may also enforce the minimum standards and regulation pertaining to hazardous waste, as adopted by the California Department of Health Services.

E. STRUCTURAL HAZARDS

A landmark in earthquake safety engineering legislation was passed by California after the 1933 Long Beach earthquake, when the State adopted the Field and Riley acts and established the State Office of Architecture and Construction. The Field Act placed the design of schools under the supervision of the newly created Office of Architecture and Construction. The Riley Act placed design requirements on other buildings used for human occupancy, other than dwellings designed for two families or less. As a general rule, buildings constructed after 1933 have performed better and are generally considered safer than most buildings constructed before 1933. Since 1933, building codes have been continuously improved; after each earthquake, new lessons are learned on the adequacy of the old codes.

More recent State legislation has been passed regarding seismically-induced structural hazards. State law requires that construction plans for all essential service, structures (fire and police stations, etc.) be reviewed by the State Architect's office or an on-staff registered structural engineer. This legislation is similar to the Hospital Act which was passed soon after the San Fernando earthquake and requires the State Architect's office to review building plans for new hospitals or specified additions to existing hospitals.

Effective January 1, 1987, the State requires all cities located in Seismic Zone 4 (this includes Ventura) to conduct an inventory of potentially hazardous structures, including unreinforced masonry buildings. After the survey is conducted, a program to mitigate these potentially hazardous structures must be developed and sent to the California Seismic Safety Commission for review and approval. This structural hazard abatement program must be completed by 1990.

The previously described program that located and mapped the locations of unreinforced masonry structures is a major first step required for the ultimate abatement of structural hazards in the City.

Another hazard reduction program has been implemented in the City and throughout most of Ventura County and is somewhat unique in California and the rest of the country. This program is an agreement between the County of Ventura and most of the unincorporated cities to provide mutual aid building inspector services after an earthquake or other major disaster. This program establishes a means to provide rapid and efficient evaluations of structures after a disaster to determine if buildings are safe for occupancy. This agreement also assists in estimating the dollar amount in building damage which is necessary for applying for disaster relief funds. This reduces the potential for health and safety risks occurring from the use of unsafe buildings.

F. DISASTER PREPAREDNESS

The City Fire Department has devised and maintains an up-to-date comprehensive Emergency Preparedness Plan which addresses the City's planned response to extraordinary emergency

situations associated with natural disasters, hazardous material incidents, and nuclear defense operations. It provides operational concepts relating to the various emergency situations, identified components of the Local Emergency Management Organization, and describes the overall responsibilities of the organization for protecting life and property and assuring the overall well being of the population. The plan also identifies the sources of outside support which might be provided through mutual aid and specific statutory authorities by other jurisdictions, State and Federal agencies, and the private sector. This plan has been reviewed and approved by the California Office of Emergency Services. Regional and State-wide coordination of disaster relief operations and resources would become the responsibility of the County Office of Emergency Preparedness and the California Office of Emergency Services.

The City's Emergency Preparedness Basic Plan contains planning and operational checklists, and guidelines for City disaster response departments such as Fire, Police, Public Works, etc. to assist them in formulating and executing their specific responsibilities before, during, and after a disaster. This plan also includes general standard operating procedures for all departments during all types of disasters, the functions of disaster support organizations (American Red Cross, Salvation Army, etc.) and special legislation addressing natural and man made disasters.

The City Fire Department also maintains a City-wide Evacuation Plan. This Plan details evacuation routes from the City in the event of a major disaster, and specifies emergency shelters to be used during emergency or disaster episodes. The Evacuation Plan must be reviewed and approved by the California Office of Emergency Services.

The disaster response of the responsible City agencies has not yet been tested by a major disaster in the area. Therefore, the City's existing emergency preparedness and evacuation plans are focused on potential natural and man made disasters and the likely effects and necessary responses.

FIGURE 13

LAND USE ACCEPTABLILITY MATRIX

- ACCEPTABLE LAND USE
- CONDITIONALLY ACCEPTABLE LAND USE IF POTENTIAL HAZARD CAN BE MITIGATED TO AN INSIGNIFICANT LEVEL
- UNACCEPTABLE LAND USE

	OPEN SPACE/AGRICULTURE	PASSIVE RECREATION	LOW-MODERATE DENSITY RESIDENTIAL/UTILITY AND ROAD R.O.W.S	OFFICES, NEIGHBORHOOD COMMERCIAL	REGIONAL COMMERCIAL AND INDUSTRIAL	VISITOR SERVING	HIGH DENSITY RESIDENTIAL	CRITICAL FACILITIES
SURFACE RUPTURE								
Active Fault	Acceptable	Acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable
Alquist-Priolo Zone	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
Inactive	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
GROUNDSHAKING								
Long Period-Strong Shaking	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
Long Period-Slight to Moderate	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
Short Period-Strong Shaking	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
Short Period-Slight to Moderate	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
LIQUEFACTION								
High	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
Medium	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Conditionally acceptable	Unacceptable
Low	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
TSUNAMI & SEICHE								
Hazard Area	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
LANDSLIDES								
High	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable
Low	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
SUBSIDENCE								
Hazard Area	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable
EXPANSIVE SOIL								
High	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
Moderate	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
Low	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
FLOODING								
100 Year Flood Plain	Acceptable	Acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable
BEACH EROSION								
Hazard Area	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable
DAM INUNDATION								
Hazard Area	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable
FIRE HAZARD								
High Wild Fire Hazard Area	Acceptable	Acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Conditionally acceptable	Unacceptable

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APPENDIX A

GLOSSARY OF TERMS

Critical Facility - Includes facilities housing or serving many people or otherwise posing unusual hazards in case of damage from or malfunction during an earthquake, such as hospitals, fire, police, and emergency service facilities, utility "lifeline" facilities, such as water, electricity, and gas supply, sewage disposal, and communications and transportation facilities.

Fault - A fracture in the earth's crust forming a boundary between rock masses that have shifted.

> **Active Fault** - A fault that has moved recently and which is likely to move again. For planning purposes, "active fault" is usually defined as one that shows movement within the last 11,000 years and can be expected to move within the next 100 years.
>
> **Potentially Active Fault** - (1) A fault that last moved within the Quaternary Period before the Holocene Epoch (the last 2,000,000 to 11,000 years); (2) A fault which, because it is judged to be capable of ground rupture or shaking, poses an unacceptable risk for a proposed structure.
>
> **Inactive Fault** - A fault which shows no evidence of movement in recent geologic time and no potential for movement in the relatively near future.

Fire Break - A natural or artificial barrier where plants have been removed for fire-control purposes.

Fire Hazard Severity Scale - A system of classifying and delineating wildland areas of varying potential for fire using three criteria: fuel loading (in terms of wildland plants); weather; and slope.

Fire Hazard Zone - An area where, due to slope, fuel, weather, or other fire-related conditions, the potential loss of life and property from a fire necessitates special fire protection measures and planning before development occurs.

Flood Plain - A lowland or relatively flat area adjoining inland or coastal waters that is subject to a one-percent or greater chance of flooding in any given year (i.e., 100-year flood).

Fuel Break - A wide strip of land on which plants have been thinned, trimmed, pruned, or changed to types which burn with lower intensity so that fires can be more readily put out.

Fuel Loading - The quantity of plants and other fuel per unit of land area.

Fuel Management or Fuel Modification - The use or removal of plants in the wildlands to reduce the intensity of an approaching wildfire and to increase the ability to prevent or fight fires while preserving and enhancing environmental quality.

Geotechnical Evaluation - A professional evaluation using scientific methods and engineering principles of geology, geophysics, hydrology, and related sciences.

Greenbelt - A strategically located, landscaped zone of variable width in which a low volume of fuel is maintained in a "green" or "live" condition throughout the year by irrigation, designed to slow or stop the spread of fire and to prevent soil erosion (e.g., golf courses, parks).

Ground Failure - Mudslide, landslide, liquefaction, or the seismic compaction of soils.

Hazardous Building - A building that may be hazardous to life in the event of an earthquake because it:

(1) Was constructed prior to the adoption and enforcement of local codes requiring earthquake resistant design of buildings;

(2) Is constructed of unreinforced masonry; or,

(3) Exhibits any one of the following characteristics:

- Exterior parapets and ornamentation that may fall on passers-by;
- Exterior walls that are not anchored to the floors, roof, or foundation;
- Sheeting on roofs or floors incapable of withstanding lateral loads;
- Large openings in walls that may cause damage from torsional forces; or,
- Lack of an effective system to resist lateral forces.

Hazardous Material - An injurious substance, including pesticides, herbicides, toxic metals and chemicals, liquified natural gas, explosives, volatile chemicals, and nuclear fuels.

Landslide - A general term for a falling mass of soil or rocks.

Liquefaction - A process by which water-saturated granular soils transform from a solid to a liquid state because of a sudden shock or strain.

Maximum Credible Earthquake - The most severe earthquake that appears capable of occurring, based on present information, including (a) the seismic history of the area; (b) the length of significant faults within 100 kilometers; (c) the type(s) of faults; and, (d) the tectonic or structural history of the region.

Minimum Fire Flow - A rate of water flow that should be maintained to halt and reverse the spread of a fire.

Mudslide (Mudflow) - A flow of very wet rock and soil.

Potentially Hazardous Facility - Includes dams and reservoirs, nuclear reactors, tall buildings, other buildings housing many people, such as schools, prisons, and hospitals, and other structures containing large quantities of potentially explosive or toxic materials.

Seiche - An earthquake-induced wave in a lake, reservoir, or harbor.

Subsidence - The gradual, local settling or sinking of the earth's surface with little or no horizontal motion. (Subsidence is usually the result of gas, oil, or water extraction, hydrocompaction, or peat oxidation, and not the result of a landslide or slope failure.)

Surface Rupture - A break in the ground's surface and associated deformation resulting from the movement of a fault.

Tsunami - A wave, commonly called a tidal wave, caused by an underwater seismic disturbance, such as sudden faulting, landslide, or volcanic activity.

Wildland - A nonurban, natural area which contains uncultivated land, timber, range, watershed, brush, or grasslands.

Soruce: Office of Planning and Research, General Plan Guidelines, 1982.

APPENDIX B

GEOLOGICAL TIME SCALE

GEOLOGIC TIME SCALE

Age	Era	Period		Epoch	TIME Millions of Years	TIME OF APPEARANCE OF DIFFERENT FORMS OF LIFE
Age of Mammals	Cenozoic	Quaternary		Holocene		
				Pleistocene	2-3	Ice age, evolution of man.
		Tertiary		Pliocene	12	Age of mammoths.
				Miocene	26	Spread of antropoid apes.
				Oligocene	37-38	Origin of more modern families of mammals, grazing animals.
				Eocene	53-54	Origin of many modern families of mammals, giant mammals.
				Paleocene	65	Origin of most orders of mammals, early horses.
Age of Reptiles	Mesozoic	Cretaceous		Late Early	136	Appearance of flowering plants; extinction of dinosaurs at end; appearance of a few modern orders and families of mammals.
		Jurassic		Late Middle Early	190-195	Appearance of some modern genera of conifers; origin of mammals and birds; height of dinosaur evolution.
		Triassic		Late Middle Early	225	Dominance of mannal-like reptiles.
Age of Invertebrates	Paleozoic	Permian		Late Early	280	Appearance of modern insect orders.
		Carbon-iferous Systems	Pennsyl-vanian	Late Middle Early		Dominance of amphibians and of primitive tropical forests which formed coal; earliest reptiles.
			Missis-sippian	Late Early	345	Earliest amphibians.
		Devonian		Late Middle Early	395	Earliest seed plants; rise of bony fishes.
		Silurian		Late Middle Early	430-440	Earliest land plants.
		Ordovician		Late Middle Early	500	Earliest known vertebrates.
		Cambrian		Late Middle Early	570	Appearance of most phyla of invertebrates.
	Precambrian				3,600+	Origin of life; algae, worm burrows.

Noise Element
TECHNICAL APPENDIX

City of San Buenaventura

NOISE ELEMENT

TECHNICAL APPENDIX

CITY OF SAN BUENAVENTURA

August 1989

NOISE ELEMENT
TECHNICAL APPENDIX

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INTRODUCTION

The Noise Element Technical Appendix is a part of the City's Comprehensive Plan. It consists of sections which describe the various characteristics of noise, including how noise is measured and defined, the effects of noise, the existing land use noise standards in the City, and the existing and projected noise environment in the Planning Area. The Noise Element Technical Appendix also contains several charts which further the explanations and descriptions in the text, and maps showing both the existing and projected Community Noise Equivalent Level (CNEL) contours. The CNEL maps of existing and projected noise levels are to be used as a planning reference for land use decisions. The Noise Element Technical Appendix provides the background and database upon which the goals and objectives and policies of the Noise Element are based.

I. GENERAL DESCRIPTIONS OF NOISE CHARACTERISTICS

A. DIFFERENCE BETWEEN NOISE AND SOUND

Noise is defined as unwanted or objectionable sound.
Sound is a form of energy detectable by the human hearing system, which is commonly produced when some object is set into vibration. The vibration is transmitted to a surrounding media, such as air, causing pressure variations or "sound waves" among the air particles. These waves spread outward from the source, and along their path can reflect off surfaces, can bend around obstacles, and can be absorbed in insulative materials. If sound waves reach human ears, the membranes at the end of the ear canal begin to vibrate. The vibration is transmitted by small bones in the middle ear to the cochlea, where the inner ear's sensory organ is located. Nerve impulses originating in the cochlea are interpreted by the brain as "sound."

B. MEASUREMENT OF SOUND

Sound is measured according to three properties: (1) Magnitude; (2) Frequency; and (3) Duration, all of which combine to produce the subjective experience we call "sound."

1. Magnitude

The magnitude of variations in air pressure associated with a sound wave results in the quality commonly referred to as "loudness." Human ears respond to a very wide range of

sound pressures, producing numbers of awkward size when sound pressures are related on an arithmetic (1,2,3, etc.) scale. It has therefore become customary to express sound magnitude in decibels (dB) which are logarithmic (1,10,100...) ratios comparing measured sound pressures to a reference pressure. The reference pressure commonly used in noise measurement is 20 micropascals, which is considered to be the softest sound normal ears can hear. (All dB notations used in this Appendix are sound pressure levels referenced to 20 micropascals.) This sound level is assigned the value, zero dB, and each increment in sound level of 20 dB represents a relative change in sound pressure of ten times.

a. Measuring by decibels: Because decibels are logarithmic ratios, they cannot be manipulated in the same way as arithmetic numbers. The addition of decibels produces such results as 70 dB + 70 dB = 73 dB. Thus, if a single automobile produces a sound level of 70 dB, two such automobiles would produce a total sound level of 73 dB. Twice as much acoustic energy is being generated, and this is represented in decibels as a 3 dB change. As a second example of decibel addition, if one automobile produces a sound level of 70 dB and the other 60 dB, the combined sound level will be 70.4 dB. This occurs because, when the difference between two sound levels exceeds 20 decibels, the lesser sound is negligible in terms of affecting the total level.

b. Loudness: A 3 dB increase in sound level represents a doubling of sound energy, but it will not be experienced as a doubling in loudness. Loudness refers to the way in which people judge the volume of sound. As a rule of thumb, a 1 dB change in sound level requires close attention to notice a change in loudness; while

a 3 dB change is noticeable; and a 10 dB change is nearly twice (or one-half) as loud. A noise of 70 dB sound is nearly twice as loud as 60 dB and four times as loud as 50 dB. Chart 1 illustrates the relationships among sound level, relative sound pressure and relative loudness.

c. Sound level and distance: Sound level diminishes as distance from the source increases, but at differing rates. For example, for a point source of sound in free space, the rate at which the sound attenuates is inversely proportional to the square of the distance from the source. This means the sound level drops 6 dB each time the distance from the source is doubled.

A stream of vehicles on a busy highway represents a "line" source of sound, and exhibits a rate of attenuation which is different from that of a point source. For instance, the sound level from a busy highway will drop only about 3 dB for each doubling of distance. In another example, the same noise source can exhibit both types of properties. For instance, sound attenuation from a train resembles a line source near the railroad tracks, and at further distance (beyond about 3/10 the length of the train) can be considered a point source.

CHART 1

SOUND LEVEL OF COMMON SOUNDS

Sound	Sound Pressure Level (dB)*	Relative Sound Pressure	Relative Loudness (Approximate)
Jet Take-Off, 200 feet	120	1,000	64
Riveting Machine	110		32
Power Mower, 5 feet	100	100	16
Motorcycle, 50 feet	90		8
Inside Sports Car (50 mph)	80	10	4
Vacuum Cleaner	70		2
Ordinary Conversation, 3 feet	60	1	1
Private Business Office	50		1/2
Inside Average Residence	40	.1	1/4
Soft Whisper, 5 feet	30		1/8
Inside Recording Studio	20	.01	1/16
Rustle of leaves	10		1/32
Threshold of Hearing	0	.001	1/64

*Reference 20 microPascals

Adapted from several sources

Air and ground absorption of sound will further attenuate sound levels. The rate at which these factors attenuate sound depends on the frequency content of the sound, air temperature, relative humidity, terrain, and type of ground cover. Chart 2 illustrates the relationship between sound and distance.

2. Frequency

A second characteristic of sound which must be included in its measurement is frequency. Typical community sounds consist of a wide range of frequencies from the low roar of a diesel engine to the high pitched whine of jet aircraft.

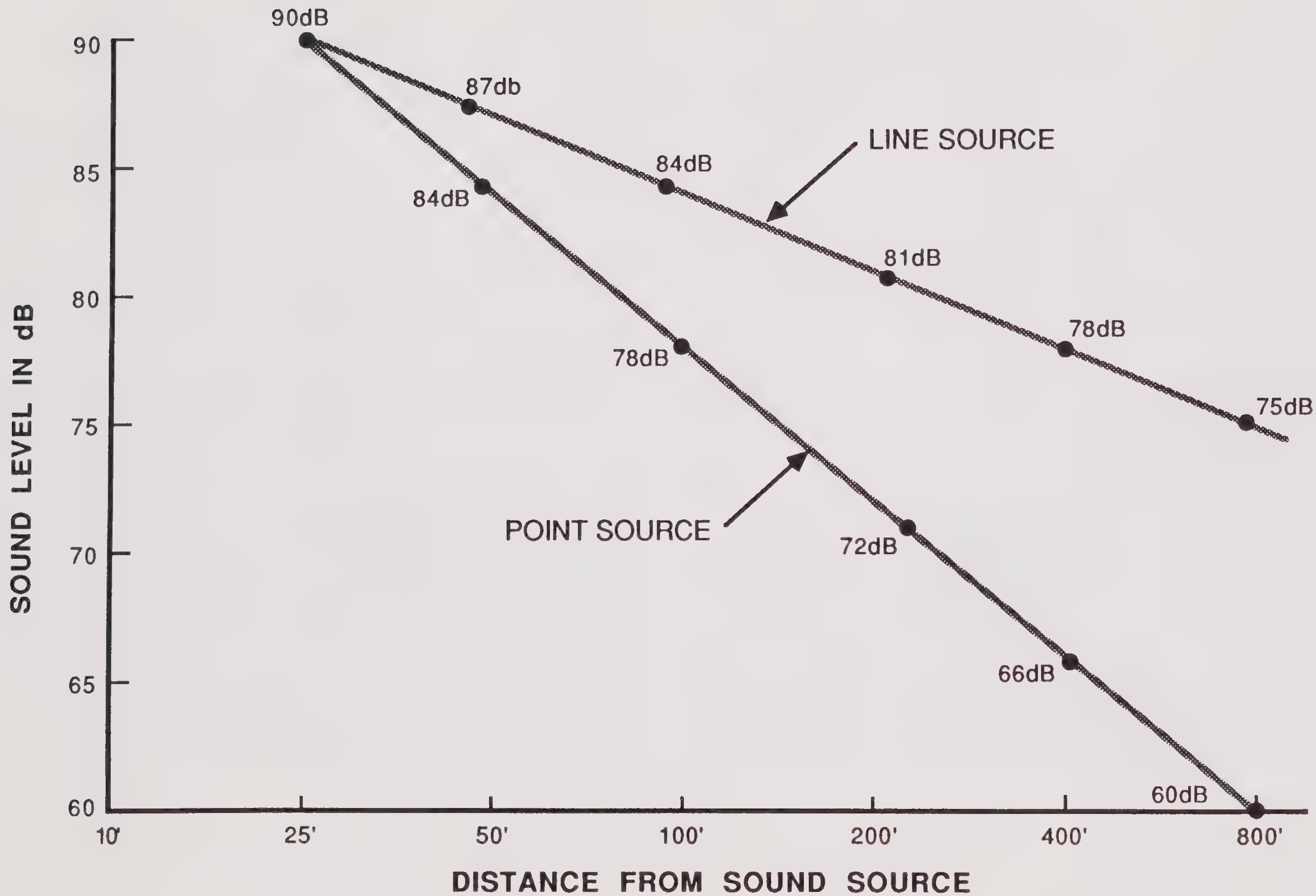
Frequency refers to the number of times per second the object producing the sound vibrates, or oscillates. The unit of measurement of frequency is Hertz - one vibration per second being equal to one Hertz (Hz).

The human ear responds to sounds whose frequencies are in the range from 20 Hz to 20,000 Hz. Frequencies above or below this range are inaudible to humans and are referred to as ultrasound and infrasound, respectively.

Within the audible range, subjective response to noise varies. People generally find higher pitched sounds to be more annoying than lower pitched sounds. Sensitivity of the ear also varies. While "loudness" depends primarily on sound pressure, it is also affected by frequency; and, while "pitch" is closely related to frequency, it also depends on sound pressure. Thus, a 20,000 Hz tone at 5 dB sound pressure level sounds just as loud as a 20 Hz tone at 70 dB sound pressure level; 20 Hz at 70 dB sound pressure

Chart 2

ATTENUATION OF SOUND LEVEL ILLUSTRATED FOR 90dB SOUND SOURCES



level is quiet to the ear; 2,000 Hz at 70 dB sound pressure level is quite loud.

Because of these variations, a great deal of effort has gone into the development of systems which relate physical measurements of noise to subjective human response. Most of these measurements are dependent upon calculations based on sound pressure levels in various frequency bands which are "weighted" to correspond with human response. However, these procedures are cumbersome for most community noise assessment needs. Presently, the most widely used measure of "loudness" for community noise evaluation is the A-weighted sound level. The primary advantage of this descriptor is simplicity, and its degree of correlation to subjective assessment of loudness and annoyance. Sound levels in this Appendix which are A-weighted are referred to as "dB(A)."

3. Duration

The third characteristic of noise which must be accounted for to describe human noise response is duration. Noise-induced hearing loss, for example, is directly related to magnitude, frequency content, and duration of noise exposure. Annoyance due to noise is also associated with how often noise is present and how long noise persists.

C. DEFINITIONS

The definitions which follow are used throughout this Appendix.

1. Ambient Noise Level:

This level represents the composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

2. Intrusive Noise:

Noise which is experienced as intrusive is noticeable over and above the existing ambient noise at a given location. The degree to which sound is experienced as intrusive depends upon its magnitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level. For example, the sound of a small child crying might be intrusive to a parent because of its informational content.

3. A-Weighted Sound Level:

The most widely used measure of loudness for community noise assessment needs, this measurement is comprised of sound pressure level in decibels, as measured by a sound level meter, using the A-weighting filter network. The A-weighting filter deemphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. It correlates positively with such subjective reactions to noise as the experience of loudness or annoyance. For further explanation of "annoyance" refer to Section II-B.

4. Time Weighted Noise Measures:

Environmental noise at any location usually fluctuates from quiet one moment to loud the next. To adequately describe a noise environment, it is necessary to quantify the variation in noise level over time.

a. Exceedence Levels

One way to do this is to use a statistical approach and to specify noise levels which are exceeded a given percentage of the time. Commonly used exceedence levels:

L90 - that level exceeded 90 percent of the time, sometimes referred to as the Residual Noise Level.

L50 - That level exceeded 50 percent of the time, the median sound level.

L10 - That level exceeded 10 percent of the time, representing higher level, shorter duration noise.

b. Energy Equivalent Sound Levels

Leq: Another approach to quantifying time-varying noise levels is to calculate the Energy Equivalent Sound Level (Leq) for the time period of interest. Leq represents a sound level which, if continuous, would contain the same total acoustical energy as the actual time-varying noise which occurs during the observation period.

Application of Leq to problems of community noise measurement presumes that there is a trade-off between noise level and length of exposure. Two noises can represent the same amount of acoustical energy, even though one is of relatively lower level but longer duration. Both noises have the same Leq value and are therefore considered identical in this methodology. Leq is the basis for the Community Noise equivalent Level discussed below and used in this Appendix.

c. Community Noise Equivalent Levels

CNEL - Noise in a residential, or other noise sensitive setting is often more bothersome at night than during daytime. At night, background noise levels outdoors are generally lower than during the day. Also, the activity in most households decreases at night, lowering internally generated noise levels. Individual noise events are therefore more intrusive at night, since they stand out against the background more sharply than during the daytime.

Community Noise Equivalent Level (CNEL) and Day-Night Average Level (Ldn) are noise indices which attempt to account for differences in intrusiveness of noise between daytime and nighttime. These values result from a process which involves averaging hourly Energy-Equivalent Sound Levels for a 24 hour period, with a weighting factor applied to evening and nighttime Leq values.

For CNEL and Ldn calculations, the 24 hour day is divided into time periods with the following weightings:

Community Noise Equivalent Level

Daytime:	7 a.m.- 7 p.m.	Weighting factor of 1 or 0dB
Evening:	7 p.m.-10 p.m.	Weighting factor of 5 or 3dB
Nighttime:	10 p.m.- 7 a.m.	Weighting factor of 10 or 10dB

Day-Night Average Level

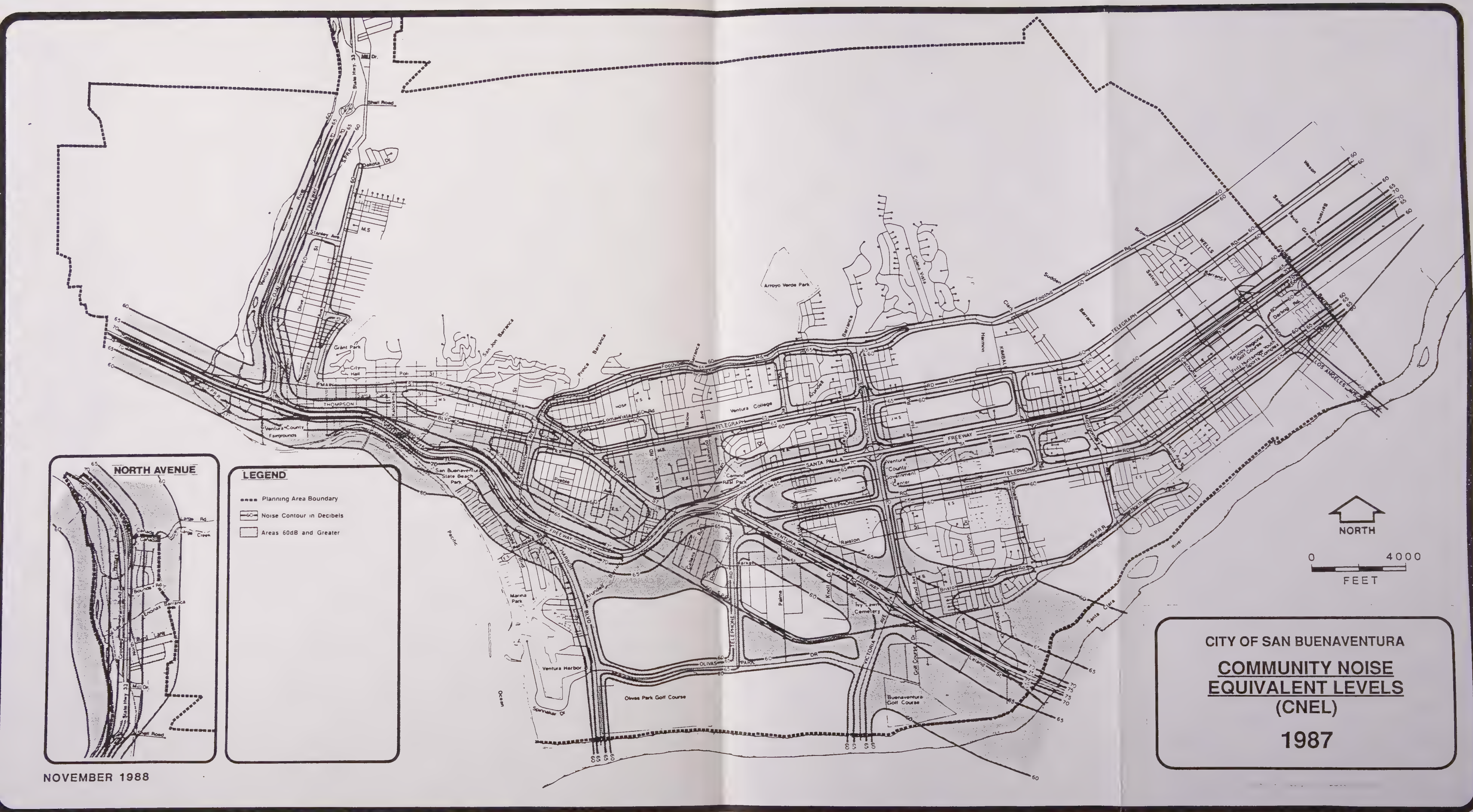
Daytime:	7 a.m.-10 p.m.	Weighting factor of 1 or 0dB
Nighttime:	10 p.m.- 7 a.m.	Weighting factor of 10 or 10dB

CNEL and Ldn have been shown to have good correlation with group responses to long-term noise exposure. In practice, highway, railroad, and general community noise in Ventura has shown that the two measures consistently agree within 1.0 dB. CNEL has been used in this Appendix to satisfy California Noise Insulation Standards.

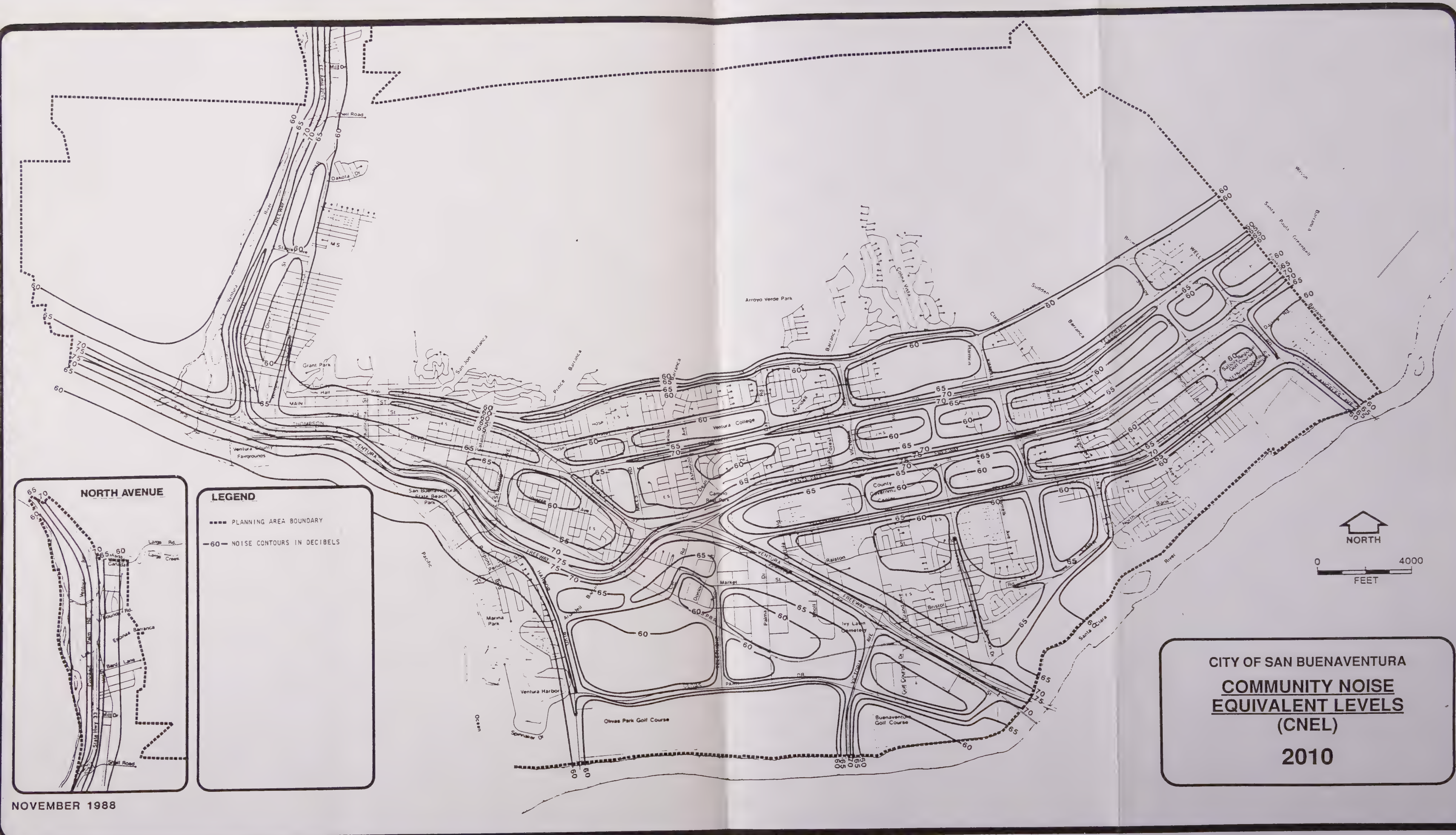
5. Noise Exposure Contours

Noise exposure contours represent the mapped expression of points of equal average noise level, analogous to topographic contours, which are the mapped expression of points of equal elevation. Noise contours can be drawn with respect to any noise measure. To satisfy State requirements for the City's Noise Element, CNEL has been used to develop Noise Contour Maps in this Appendix. Noise contours usually refer to a single source of noise such as a freeway, although they sometimes combine multiple sources.

The City has developed CNEL Noise Contour Maps for existing noise sources, including freeways, primary arterial highways, and railroad operations. Noise sources projected to exist in 2010 have also been calculated. Both studies are presented as maps on the following pages.


CITY OF SAN BUENAVENTURA
COMMUNITY NOISE EQUIVALENT LEVELS (CNEL)
1987
LEGEND
Planning Area Boundary
Noise Contour in Decibels
Areas 60dB and Greater
NORTH AVENUE
NORTH
0 4000
FEET
NOVEMBER 1988

McClelland


CITY OF SAN BUENAVENTURA
COMMUNITY NOISE EQUIVALENT LEVELS (CNEL)
2010
LEGEND
PLANNING AREA BOUNDARY
—60— NOISE CONTOURS IN DECIBELS
NORTH AVENUE
NORTH
0
4000
FEET
NOVEMBER 1988
Arroyo Verde Park
Grant Park
Ventura College
Ventura County Fairgrounds
San Buenaventura State Beach Park
Marina Park
Ventura Harbor
Olivas Park Golf Course
Buenaventura Golf Course
Ivy Lawn Cemetery
Pacific
Ocean
Santa Clara
River
FREEWAY
VENTURA
Shell Road
Ralston
Market
St
Bristol

II. EFFECTS OF NOISE

Noise may have a variety of consequences for the physical, psychological, social and economic health of human beings. Auditory effects of noise include hearing loss and interference with communication. Non-auditory effects include physiological reactions, interference with sleep, adverse effects on human performance, and annoyance.

For the purposes of this Appendix, the effects of noise on human beings are divided into physical, psychological, social and economic consequences.

A. PHYSICAL AFFECTS

1. Hearing Loss

Permanent hearing loss is, so far as is presently known, the most severe effect of noise upon health. While noise-induced hearing loss was once associated primarily with certain industrial situations, increasing numbers of people in urban areas are presently exposed to ambient noise levels which, over long periods of exposure, may cause significant hearing impairment. Even where daily exposure to general community noise does not in itself pose a distinct hazard to hearing, it may still contribute to hearing loss. Community noise may prevent the person who works in a high noise situation from receiving enough quiet while at home to allow the ears to recuperate from temporary hearing loss experienced at work.

Hearing loss may be either temporary or permanent. Temporary loss, attributable to fatigue of the inner ear, can occur after brief exposure to high noise levels, or after longer exposure to more moderate levels. Often this

temporary decrease in hearing acuity is accompanied by ringing or buzzing sensations in the ears. Continued exposure to levels sufficient to cause temporary hearing impairment can, over a period of time, result in damage to the inner ear that is permanent. Permanent hearing loss cannot be restored, either through medical treatment or hearing aids.

Hearing loss resulting from noise is referred to as a "noise-induced threshold shift." It usually first affects those frequencies necessary to hear and understand speech communication. People who have a moderate threshold shift often are not aware of the condition except for the difficulty they experience in understanding others' speech, especially when some background sounds are also present.

Noise-induced permanent threshold shift is related to the intensity, duration, and frequency content of noise exposure. From extensive studies of industrial noise, it has been found that 8-hour exposure to continuous noise levels below approximately 80 dB does not cause significant permanent threshold shift.

However, temporary threshold shift is experienced at these and even lower levels. Workers covered by the Occupational Safety and Health Act (OSHA) must be protected from noise exposures exceeding 90 dB(A) for 8 hours; there is some question whether this standard adequately protects workers against hearing impairment.

On the basis of available evidence, the U.S. Environmental Protection Agency has concluded that a 24-hour Energy Equivalent Sound Level (Leq) of 70 dB(A) is the maximum exposure consistent with long-term protection against significant hearing loss at a frequency of 4,000 Hz. Since this frequency is within the most sensitive range of the ear, protection at 4,000 Hz insures that the entire

frequency spectrum of human hearing would be protected from significant hearing loss.

2. Other Physical Reactions to Noise:

In addition to hearing loss, a number of other physiological responses to noise have been documented. Changes in cardiovascular blood pressure and blood volume, breathing rate, pulse rate, and endocrine gland secretions have all been observed to result from exposure to noise. The non-auditory effects are usually termed "arousal" or "stress" reactions and are very difficult to distinguish physiologically from responses that occur in emotional states of fear or anger. They usually take place without conscious knowledge of their occurrence.

In addition to rapid heart beat, blood vessel constriction, dilation of the pupils, paling of the skin, headaches, muscle tension, nausea, insomnia and fatigue, if the noise is of sufficient level, the stomach, esophagus, and intestines may be seized by spasms.

It is not yet clear whether these physiological responses are associated with the onset or prolongation of any disease in humans. Noise has been cited as a contributing factor to the development of peptic ulcers, hypertension, colitis, migraine headaches and other disorders.

A persistent myth with regard to the effect of noise on people is that people learn to adapt to their noise environment. Adaptation implies that with repeated exposure to a stimulus, people cease to exhibit a response. While it is true that after a time people can become relatively unconscious of noise, it is uncertain whether physiological adaptation occurs, meaning that people cease to show a stress response.

Stress reactions have not been observed at noise levels below that at which hearing loss can occur; the threshold of this stress effect seems to be 70-80 dB(A). Therefore, if people are protected from noise exposures capable of causing hearing loss, it is believed they will also be protected from the experience of any noise-induced non-auditory disease.

3. Sleep Interference

From everyday experience as well as laboratory research, it is evident that noise interferes with sleep. In addition to awakening a person, or preventing the person from falling asleep, noise can shift the stage of sleep from a deep, restful stage to a lighter one. In laboratory tests this is observed as a change in brain-wave pattern of a sleeping subject. The significance of these shifts in stage of sleep to a person's long term well-being has not been established.

Disruption of sleep can occur at sound levels as low as 35 dB(A), but there is a great deal of variability in response among individuals. Some people awaken consistently when exposed to rather low level noise while others practically never awaken, even at levels up to 75 dB(A). A number of factors influence the degree to which noise may interfere with sleep.

Impulsive or fluctuating noise is more disruptive than steady-state noise. Familiarity with the noise may reduce its ability to awaken, but there is no clear evidence that the quality of sleep is unaffected. Noise which has some information value is more likely to wake a person. A familiar example is the parent who awakes instantly to the faint sound of a crying child, but sleeps through virtually

everything else. In addition, the ability of noise to disrupt sleep is related to age. Elderly persons are much more easily awakened by noise than younger age groups, and once awakened find it more difficult to return to sleep.

Because of the number of variables involved, it has been difficult to establish a quantitative relationship between noise exposure and sleep interference. In light of present knowledge, however, researchers recommend that noise levels inside dwellings not exceed 35-40 dB(A) for satisfactory sleeping conditions.

B. EFFECTS OF NOISE ON PSYCHOLOGICAL PERFORMANCE

1. Ability to perform tasks

Noise levels, such as those found in certain industrial situations, are known to adversely affect the ability to perform physical tasks, even when the task requires little mental concentration. For a familiar, steady-state noise this is generally true only when the noise exceeds 90 dB(A). Irregular or unfamiliar bursts of noise can affect work efficiency at lower noise levels. Usually, the total quantity of work performed does not decrease, but the number of errors made increases. Any task requiring the use of speech or other auditory signals is subject to noise interference.

The ability to perform mental tasks such as reading, problem solving, or writing is also impaired by a noisy environment. As with sleep interference, there is a great deal of variability in individuals, responses. The degree of distraction or interference with concentration, is related to the person's state of motivation, morale, stress, and fatigue, as well as characteristics of the noise such as intensity, pitch, impulsiveness, and information content. Complex or demanding tasks are more likely to be disrupted by noise than are simple assignments.

While the impact of noise on mental efficiency has not been correlated to some measure of noise exposure, higher noise levels make it less likely that performance will adapt. Even when identical performance is achieved in or out of noise, there may yet be a cost to the individual. This cost can be increased fatigue at the end of the day, or reduced ability to react to additional demands of a job.

2. Annoyance

a) Definition

Annoyance is considered here to mean feelings of displeasure of resentment associated with the experience of noise, either because the noise is judged unpleasant or because the noise disrupts some ongoing activity. Annoyance is partly a psychological response to noise and partly a sociological response. Attitudes or values prevalent in a particular community can influence an individual's evaluation of noise.

b) Measurement of Noise related to Annoyance

Community-wide annoyance by noise has been extensively studied through social surveys. These attempts to gauge the intrusiveness of noise by questioning large numbers of people about the manner in which noise may affect their lives and about whether and to what degree they consider noise from various sources to be disturbing. Such studies have been performed in numerous counties and in many cities and regions within the United States. These studies are usually geared to investigate the impact of noise on residential populations.

c) Prediction of Community-Wide Response to Noise - CNEL

When the responses to attitudinal surveys are correlated within measures of the noise environment to which participants are exposed, predictions of community-wide response to noise are possible. Time-integrated measures of noise (such as Community Noise Equivalent Level) allow significantly better prediction of perceived annoyance than maximum or peak-level

measures. While most surveys have addressed aircraft noise exposure, studies of noise from other sources show relationships between noise exposure and annoyance similar to those found in aircraft studies.

While it is impossible to predict what a particular individual's reaction to a given noise will be, there is good statistical correlation between characteristics of noise exposure and average annoyance reported by groups of individuals. The higher the average noise level, the greater the number of persons who report annoyance and the more frequently they report being bothered. As noise levels increase there is smaller variation in annoyance response, indicating a greater consensus among individuals.

d) Variations in Response to Noise

The variation in response can be explained statistically by factors other than the noise itself. For example, people who are afraid of airplane crashes are more likely to be annoyed by aircraft noise. People who are more highly educated or who are more economically well-off have higher than average annoyance scores. If people feel the noise source is necessary for social or economic reasons; if they personally benefit from it; if they feel those responsible for the noise source care about their welfare, or if they like them; they are less likely to report dissatisfaction with the noise.

Subjective responses to noise can be related to the character of the noise. The higher the noise level and the longer it lasts, the more persons are bothered. Higher pitched sounds are more disturbing than lower sound levels. If the noise is impulsive, inter-

mitttent, or rhythmic, it will be more bothersome than steady-state noise.

Where and when the noise occurs will influence perceived annoyance. Noise that is accepted in a downtown area may be found objectionable in a suburban or rural setting. When noise occurs in the evening or at night, it is found to be more disturbing than during the day. If noise interrupts some activity such as speech, watching television, or relaxation, it is highly objectionable. People are seldom upset with noise they themselves make or which they have chosen to experience.

Finally, excessive exposure to noise may also cause symptoms of anxiety, anger, vertigo.

C. SOCIOLOGICAL EFFECTS OF NOISE

Adaptations to noise intrusions may adversely affect group interrelationships. The intrusion of noise can affect every facet of human existence -- family, occupational, educational and recreational. The adverse effects of individual reactions to noise are compounded in the group situation. Most important, noise may threaten the ability to communicate and comprehend.

Interference with the ability to hear and understand speech communication is one of the more common experiences of noise intrusion. In a highly developed society, much value is placed on verbal exchange. Noise can reduce the amount and quality of this interaction.

The impact of noise on speech communication can be evaluated in terms of speech intelligibility requirements. Speech intelligibility is measured in terms of the percentage of key words in a group of sentences that can be correctly understood. As noise level increases, the percentage of words understood decreases,

unless the people communicating move closer together or raise their voices. One hundred percent intelligibility is not necessary for satisfactory communication in all situations. Most people can correctly infer the content of a sentence even though one or more words may not have been heard. Once intelligibility drops below about 90 percent, however, conversation becomes strained.

For normal one-to-one conversation to proceed in the outdoor environment (with the distance between speaker and listener usually being around five feet), background noise levels should not exceed 50-60 dB(A). This assumes that 95 percent intelligibility is satisfactory. For interior spaces, a noise level not exceeding 40-45 dB(A) will permit 100 percent sentence intelligibility. This, however, assumes the speakers are young adults with normal hearing. Children have less precise speech than do adults. Also, their knowledge of language makes them less able to understand speech when some speech cues are lost. Children under about 13, the elderly, hard of hearing, and people with dialect differences all require lower background sound levels than those indicated.

D. ECONOMIC EFFECTS OF NOISE

The costs associated with adverse noise impacts and the mitigation of these adverse impacts are appreciable. They include medical care, loss of efficiency and production on the job, the reduction of property values, litigation, expensive mitigation measures, such as freeway soundwalls, stricter construction requirements, and increased residential and commercial rental vacancies.

III. EXISTING LAND USE STANDARDS

A. MAXIMUM RESIDENTIAL NOISE STANDARDS

1. Definitions

The terms, standards, guidelines and regulations are used by both the Federal and state agencies which have developed policies regarding noise. Standards refer to actual, measured sound levels, in dB(A), Ldn or other commonly used measure of sound, which are used in criteria for acceptable or unacceptable levels of sound. Depending upon the agency involved, violation of these criteria may carry sanctions such as loss of project funding.

Guidelines, however, refer to sound levels which may be used by planners to evaluate projects in terms of acceptable noise levels or to suggest mitigation measures.

Regulations refer to the implementation of a legal mandate. They also may impose sanctions within the agencies jurisdiction.

The development of City noise control policies must be undertaken with an understanding of the guidelines, standards, and policies already existing at the State and Federal levels of government. The role of the City in noise abatement is, in some instances, pre-empted by State or Federal legislation, such as the State noise standards applicable to multi-family dwellings. In other instances, the City must assume the role of enforcement of standards or regulations which have been adopted at another level of government. A summary of important noise control standards guidelines and regulations follows:

2. Federal Noise Standards

a) Environmental Protection "Agency

The role of the Environmental Protection Agency Health and Welfare Criteria:

The Noise Control Act of 1972 established a national policy "... to promote an environment for all Americans free from noise that jeopardizes their public health and welfare." The Environmental Protection Agency was directed by Congress to publish information about levels of environmental noise consistent with protection of public health and welfare with an adequate margin of safety. Chart 3 summarizes levels identified by the EPA.

It is EPA's judgment that maintenance of levels of environmental noise at or below those specified in Chart 3 is required to protect the public from adverse effects on health and welfare. With respect to a residential setting, this gives consideration to the following factors:

1) Conservation of hearing requires a quiet residential environment to permit the human hearing mechanism to recuperate if it is exposed to higher levels of noise in an occupational or other setting.

2) Normal speech communication outdoors requires that background levels not exceed an energy average of 50-58 dB(A).

3) Normal sound attenuation of a residential structure, with windows partly open for ventilation, will reduce exterior noise to an indoor level which should in most cases protect against sleep interference.

CHART 3

SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY
ENVIRONMENTAL PROTECTION AGENCY

Effect	Level	Area
Hearing Loss	Leq(24) - 70 dB	All areas
Outdoor activity interference and annoyance	Ldn - 55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	Leq(24) - 55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity Interference and annoyance	Ldn - 45 dB	Indoor residential or hospital areas.
	Leq(24) - 45 dB	Other indoor areas with human activities such as schools, etc.

Explanation of Chart 3:

1. Leq(8) represents sound energy averaged over an 8-hour period, while Leq(24) averages energy over a 24-hour period.

2. The hearing loss level identified here represents annual averages of the daily sound level over a period of forty years.

The levels identified by the EPA were established without consideration of the cost or feasibility of attainment, and they do not constitute an Agency standard. However, the identified levels provide a basis for assessing the effectiveness of noise source emission regulations, land use policies, and building codes, in protecting the public health and welfare. Specific regulatory action must consider technical feasibility and economic reasonableness, the scope of time over which results can be expected, and specific problems of enforcement. In the process of balancing these sometimes conflicting elements, the public health and welfare consequence of a specific decision can be evaluated against the environmental noise levels identified by the EPA.

b) <u>Department of Housing and Urban Development</u>

The EPA is not the only Federal agency with standards for noise levels. The Department of Housing and Urban Development also incorporates Noise Standards, which are contained in HUD Circular 24 CFR part 51.
Briefly, the policy states that HUD will:

1. Encourage land utilization patterns for housing and other municipal needs that will separate uncontrollable noise sources from residential and other noise-sensitive areas.

2. Withhold HUD financial support for construction of noise-sensitive development, particularly housing, on sites which are adversely impacted by noise.

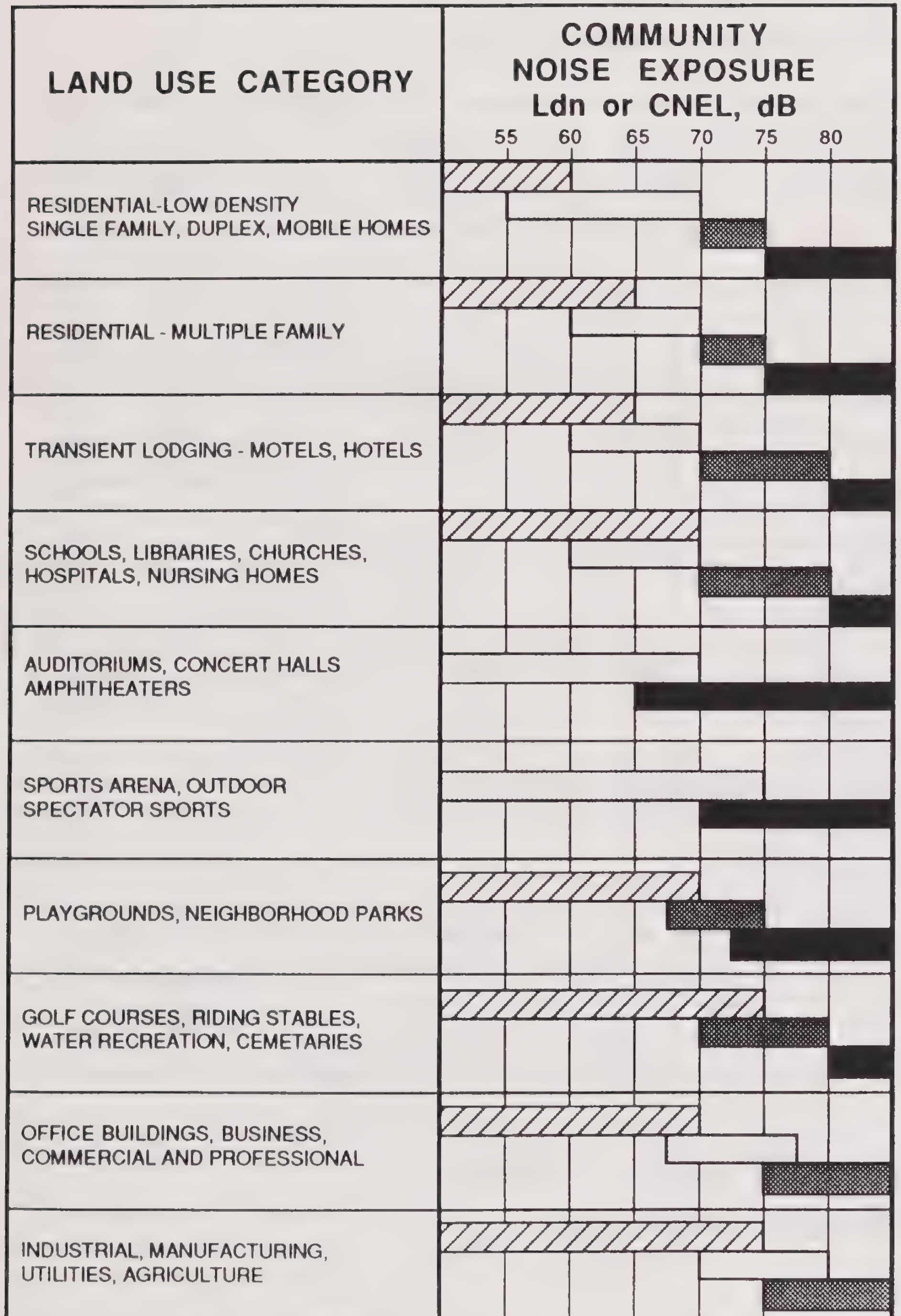
   Affected programs include low-income housing assistance, interest subsidies, and loan guarantees such as FHA Mortgage Insurance.

The HUD standards define four noise exposure categories which are applied to the site of proposed construction: Acceptable, Discretionary-Normally Acceptable, Discretionary-Normally Unacceptable, and Unacceptable. Chart 4 illustrates these HUD standards of noise acceptability to a variety of land uses. Approval of construction on sites rated Unacceptable can come only from the Secretary of HUD. In the Discretionary categories, approval requires noise attenuation measures to be included in the project design and to receive the concurrence of the HUD Regional Administrator.

c) <u>Federal Highway Administration</u>:

Federal and Highway Program Manual, Volume 7, Chapter 7 establishes "design noise levels" for the planning and design of highway projects funded by the federal aid system. Refer to Chart 5. The regulations require that a noise analysis be conducted for highway projects, projecting anticipated highway noise levels and identifying noise sensitive land uses in the vicinity of the project. Action is to be taken to meet the standards given below where opportunities exist to do so. Federal funds may be used to construct noise barriers, to acquire land as a buffer zone, or to implement other noise abatement measures. Highway agencies are encouraged by FHWA to achieve noise levels below the "design noise levels" where this can be accomplished with benefits outweighing costs.

LAND USE COMPATIBILITY
FOR COMMUNITY NOISE ENVIRONMENTS



INTERPRETATION

Normally Acceptable

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable

New construction or development should generallly not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: "Interim Noise Assessment Guidelines," U.S. Dept. Housing and Urban Development, 1980

Chart 5

Federal Highway Administration
Design Noise Level/Activity Relationships

Activity Category	Design Noise Levels-dBA[1]		Description of Land Use Activity Category
	L_{eq} hourly	L_{10} hourly	
A[2]	57 (Exterior)	60 (Exterior)	Tracts of land which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B[2]	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in Category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals
C	72 (Exterior)	75 (Exterior)	Developed lands, properties or activities not included in Categories A and B above.
D	--	--	For requirements on undeveloped lands, see Paragraph 11.a, and c.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

1 Either L_{eq} or L_{10} design noise levels may be used.

2 Parks in Categories A and B include all such lands (public or private) which are actually used as parks as well as those public lands officially set aside or designated by a governmental agency as parks on the date of public knowledge of the proposed highway project.

3. California State Residential Noise Standards

The State of California has two sets of criteria the City must consider when developing requirements for acceptable noise levels. These include California Noise Insulation Standards, and Noise Compatibility Guidelines, emanating from the California Office of Noise Control.

a) California Noise Insulation Standards

Noise Insulation Standards are now part of the California Administrative Code, Title 24, Part 2, Sec. 2-35. These apply to all new multi-family dwelling units, including apartment houses, condominium units, hotels and motels. Detached single-family dwellings are excluded. However, the City included single-family units when adopting its Noise Insulation standards, described below under City Noise standards.

The standard considers two areas of noise control: 1) insulation of one unit from another; and 2) insulation of interior living spaces from exterior noise. The insulation requirement is implemented through the Uniform Building Code, which specified minimum design requirements for party walls and floor/ceiling assemblies in terms of Sound Transmission Class (STC) and Impact Isolation Class (IIC).

The noise insulation requirement specifies that the interior Community Noise Equivalent Level attributable to exterior sources, shall not exceed 45 dB in any habitable room. It also states that residential structures be analyzed to show that the proposed building has been designed to limit intruding noise to the

allowable interior noise level. Evidence of compliance with the standard is to consist of an acoustical analysis report prepared by a person experienced in the field of acoustical engineering and submitted with the application for a building permit. (Both of these requirements are also included in the City's Building Code.)

The noise contours produced for the Noise Element provide a basis for identifying residential projects which are affected by insulation requirements of the Noise Insulation Standards. Administrative procedures are required within the City so that affected projects receive the acoustical analysis stipulated by these standards.

b) <u>California Office of Noise Control, Noise Compatibility Guidelines</u>

The California Office for Noise Control has published guidelines for evaluating land use compatibility with various noise environments. These recommendations consider noise sensitivity factors such as:

1. Speech communication needs;
2. Subjective judgments of noise acceptability and relative noisiness;
3. Need for freedom from noise intrusions; and
4. Sleep sensitivity criteria.

Different considerations are involved in determining noise sensitivities for differing land uses and activities. For example, noise level limits for satisfactory speech communication in a home are different from those for satisfactory telephone usage in an office. The guidelines attempt to account for these

considerations as well as anticipated noise sensitive activities that occur both outdoors and indoors. Also recognized is the amount of outdoor-to-indoor noise reduction provided by typical structures.

In conjunction with the land use compatibility recommendations, the Office of Noise Control has developed numerical correction factors to be applied to noise sources. These values account for some of the influences which are expected. Significant among these influences are: existing outdoor ambient levels (which indicates relative intrusiveness of the noise source), general community attitude towards the noise source, prior history with the noise source, and tonal characteristics of the noise. When it is possible to evaluate some or all of these factors, the measured or estimated level of a noise source may be adjusted by means of these correction values in order to more accurately assess the acceptability of a new noise source.

In development of these land use acceptability recommendations, the Office of Noise Control made an effort to maintain consistency with the U.S. Environmental Protection Agency's "Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (see Chart 3). In both the EPA findings and Office of Noise Control recommendations, an interior Day-Night Average Sound Level of 45 dB, attributable to exterior noise sources, is considered to be the maximum level consistent with normal residential activity.

One of the principal reasons the State has chosen a maximum exterior noise level of 60 dB as a reasonable guideline for residential areas (including multiple

family) is because most conventional dwellings (with some windows open) under California building codes will reduce an exterior 60 dB noise level to an interior level of 40-45 dB. Except for sleeping areas, this is a typical interior noise level for most dwellings.

4. City Residential Noise Standards

a) While state law concentrated on multi-family units, the City has adopted noise insulation standards for detached buildings. This section of the City Ordinance Code follows the same standards as the California Noise Insulation Standards, but pertains to single-family detached dwellings. This section is updated from time to time as new editions of the Building Code are adopted.

b) In addition to the standards adopted above, the City has adopted a Noise Control Ordinance to resolve complaints which involve existing intrusive noise problems. The Ordinance uses ambient sound level standards developed for this Appendix, as the baseline for enforcement activities.

B. COMMERCIAL AND INDUSTRIAL NOISE STANDARDS

1. General Consideration

The consideration of noise standards for industrial and commercial zoning is less critical because noise levels for these land-use types can be much louder without generating public objection. The exception to this occurs however, when residential uses are intermixed with commercial or industrial uses, or when the noise levels spill over into residential zoning districts. Hotel and motel uses in

commercial areas may be affected, but occupants usually accept higher noise levels for these uses as a temporary nuisance.

An EPA survey undertaken in 100 cities sought to determine the maximum allowable noise levels for industrial and commercial uses. The surveys found that for industrial land use, most cities preferred a maximum day and nighttime Level of 70 dB. For commercial land use, the study suggests that most cities prefer a maximum daytime Level of 65 dB and a maximum nighttime Level of 55 dB.

2. <u>City Industrial Performance Standards</u>

The City has adopted Industrial Performance standards in its Zoning Ordinance which address noise levels generated by an industrial facility in the MPD, M-1 and M-2 zones, which could affect any nearby residential use. Refer to the applicable sections of the Zoning Ordinance for the complete text of these standards.

IV. EXISTING AND PROJECTED NOISE ENVIRONMENT

A primary objective of the Noise Element and this Technical Appendix is to provide information about the City's noise environment so that noise may be considered when evaluating land use alternatives and so that a quantitative noise ordinance may be adopted. This section discusses significant noise sources which effect the City's noise environment. For purposes of this study, the City's noise environment was described using the following methods:

- Community Noise Equivalent Level (CNEL) contours were mapped around major transportation noise sources.

- A survey was conducted in urbanized areas of the City to measure ambient noise levels.

A. NOISE SOURCES, IMPACTS AND CONTROLS

The significant noise sources within the City will be discussed by noise type including transportation, commercial/industrial sources and "population" sources.

1. Transportation

In Ventura, as in most areas, transportation facilities are by far the most significant sources of noise. In order to determine the extent of noise impact from freeways, roadways and railroads, Community Noise Equivalent Level (CNEL) contours were estimated using analytical modeling techniques, and then verified ("calibrated") in the field at selected locations for each of these transportation facilities.

Noise contours are lines of equal noise exposure drawn in the vicinity of a noise source. In accordance with

California Government Code Section 65302 (requiring the preparation of a noise element), noise contours for the City were included in the City's 1974 Noise Element and revised in 1976. One of the purposes of the current update to the Noise Element is to update these contours to reflect the noise environment of today, and to project the noise environment of the future.

Two contour maps have therefore been developed, one for the "current year" (1987) and one for expected conditions in the year 2010. On each map, the contours are drawn around the freeways, major roadways and rail lines through the City.

The contour maps show current and projected noise exposure in terms of the Community Noise Equivalent Level (CNEL). The CNEL is used throughout the State of California as a measure of the 24-hour noise exposure in an area due to transportation and community noise sources. The CNEL represents an average of all the noise occurring over a full day, with the noise levels occurring during evening and nighttime hours given an extra weighting before being included in the average. CNEL contours are shown in 5 dB interval from 60 to 75 dBA, where such contours occur.

The contours provide a good first estimate of noise exposure around major transportation facilities and assist in identifying areas where specific acoustical studies should be undertaken to determine exact noise conditions. However, it should be recognized that there is a certain inherent inaccuracy associated with the contours, notwithstanding validation measurements. The contours are generated by applying traffic flow data to a roadway segment. Changes in traffic flow, topography, roadway gradients, etc., are ignored. Thus, while the contours are extremely useful as planning tools, and they illustrate the

noise exposure in major areas of the City, they should not be used for an accurate estimate of the CNEL levels at a specific location. It should also be noted that there is a "10 log" relationship on average daily traffic and total daily rail operations. This means that an error of 10% in daily volume would result in less than a 0.5 dB error in noise exposure. A 25% error in daily volume would result in a 1 dB error, and a factor of 2 error would result in a 3 dB error in noise exposure. Thus some inaccuracy in the traffic data used to generate the contours is likely to have a small impact on the size of the contours. As discussed previously, a 1dB change in sound level requires close attention to notice a change in loudness; while a 3dB change is noticeable; and a 10dB change is nearly twice (or one-half) as loud.

a. Major Roadways (Freeways, Highways, Major City Streets)

Community Noise Equivalent Level from traffic on major roadways can be estimated from information about total traffic volume, truck traffic volume, traffic speed, distribution of traffic between daytime and nighttime hours and physical characteristics of the roadway and surrounding topography. Because vehicles on a roadway have different noise characteristics, the usual procedure is to classify roadway vehicles into at least two major categories, automobiles and heavy trucks. The contribution of other vehicles, such as buses, medium trucks, motorcycles, etc., is generally small compared to that of automobiles and heavy trucks, primarily due to the fairly small percentage of these vehicles in the traffic flow.

Methodology

The CNEL (in units of dBA) at a distance of "D" from a roadway with freely flowing traffic can be expressed as follows:

$$\text{CNEL (autos} = \text{EL (autos)} + 10 \log \frac{ADT}{24S} (d + 3e + 10n)(1-t) - 15 \log D + 10.2$$

$$\text{CNEL (trucks)} = \text{EL (trucks)} + \log \frac{ADT}{24S} (d + 3e + 10n)(t) - 15 \log D + 10.2$$

$$\text{CNEL (total)} = 10 \log \left[10^{\text{CNEL (autos)}/10} + 10^{\text{CNEL (trucks)}/10} \right]$$

Where EL = vehicle emission level (maximum passby level at 50 ft.)

ADT = average daily traffic

S = speed in mph

d = fraction of ADT occurring during day

e = fraction of ADT occurring during evening

n = fraction of ADT occurring during night

t = fraction of ADT which are heavy trucks (trucks with 3 or more axles)

The emission levels for automobiles and heavy trucks are as follows, for a speed S in mph:

EL (autos) = 38 log S + 5.6

EL (trucks) = 24.6 log S + 43.6

These equations are based on the prediction of procedures contained in the Federal Highway Administration model, "FHWA Highway Traffic Noise Prediction Model" (Report (FHWA-RD-77-108, 1978). This model as published provides the average sound level for an hourly period in the vicinity of a roadway, the

equations above have expanded upon this model to permit calculation of the CNEL.

The model presumes that all vehicles are traveling at the same speed for that vehicle category, and that there is no blocking of the line-of-sight from the observer to the roadway. The equations utilize a 4.5 dB per doubling of distance drop-off rate from the roadway, which assumes over-ground propagation and an acoustically soft terrain. Note that this rate was used for all roadways in the City, except for those sections of freeway where the road was elevated with respect to the surrounding terrain. For these conditions a drop-off rate of 3 dB per distance doubling was used. Also for these conditions, which result in contours covering several blocks, a 5 dB reduction in level due to rows of homes blocking the sight line to the roadway was included in the calculations.

Data Sources

The 1987 and 2010 CNEL contours were determined by using: current and projected traffic volumes or average daily trips provided by the City's Engineering Division; data from Caltrans and the City regarding truck volumes on State highways and City streets respectively; posted speeds for all major streets; and City topography maps to evaluate changes in grade at selected locations. It should be noted that year 2010 projected traffic volumes assumes full buildout of the year 2010 Comprehensive Plan and therefore incorporates future roadways anticipated to be built in conjunction with full buildout.

Regarding heavy truck mix, the City Traffic Engineer indicated that heavy trucks account for approximately

3.5% of traffic on arterials. Traffic count data for a local street showed less than 1% heavy truck mix. Data provided by Caltrans from counts on Highway 101 indicated a 3.5% heavy truck mix. Accordingly, a value of 3.5% was utilized for the freeways and all major through streets, while a value of 1% was utilized on all other streets.

Regarding vehicle distribution by time period, a distribution of 67% day (7 a.m. to 7 p.m.), 15% evening (7 p.m. to 10 p.m.) and 18% night (10 p.m. to 7 a.m.) was used. The difference in CNEL that would result from a different distribution of traffic, within the range of variation that might occur in a typical suburban community, is less than 0.5 dB.

Calibration (Validation of CNEL Model)

In order to test the accuracy of the CNEL contours, a series of noise measurements were obtained in order to "calibrate" or validate the noise contours. The noise monitoring instrumentation and measurement and analysis procedures utilized are the same as utilized for the ambient noise survey, discussed in the following sections.

Measurement locations were selected to cover different types of roadways with varying traffic flow characteristics. The following four sites were chosen:

Site	Type	Location
A	Freeway, heavy traffic	South Highway 101 at Palma Dr.
B	Freeway, light traffic	North of Highway 126 Camino Real Park
C	Downtown Street	Main St. at Catalina St.
D	Arterial	Telephone Road at Lark Ave.

Average sound levels were determined using 15-minute measurements at each site. Simultaneously with the noise measurements, the number of cars and heavy trucks were counted, the speed of traffic flow was determined, and the distance from the measurement location to the center of the roadway was estimated.

The CNEL equations above were modified to predict the average sound level. Note that the CNEL is an average sound level, with weighting factors applied for various times of the day. The basic prediction equations can be used from any averaging period. Using the traffic and site information collected during the measurements, the average sound level was then estimated and compared with the measured levels. The results of this analysis are shown below:

Site	Cars	Trucks	Speed	Distance	Predicted Level	Measured Level	Difference
A	1,677	18	55 mph	140 ft	71.98 dBA	71.9 dBA	0.0 dB
B	606	6	55	120	68.4	69.1	-0.7
C	358	0	40	55	66.2	66.1	0.1
D	347	1	50	80	66.7	66.1	0.6

These small differences indicate that prediction equations provide good estimates of average noise levels for a range of traffic flows, and can thus be used for CNEL contour development without any adjustments.

Note that this validation of the prediction model applies to locations relatively close to the roadway, and to relatively short time periods. Validation of the model for larger distances and longer time periods would require a much more comprehensive measurement

program, which is beyond the scope of the current study. Since the greatest concern over noise exposure typically occurs close to a roadway, validation of propagation predictions is of much lesser importance than validation of "source" noise levels. Further, if the prediction equations are accurate for a known time period, their accuracy for other time periods depend only upon the accuracy of the traffic flow information and not on the accuracy of the noise level predictions.

b. Railroads

In the vicinity of a rail line, the noise exposure can be predicted as readily as roadways. Just as roadway vehicles are divided into two major categories, the noise of a passing train is estimated by considering the contribution from two major sources, the locomotives and the rail cars.

The noise levels of these vehicles are described in terms of the sound exposure level, SEL, which is a measure that takes into account the noise level as well as the duration of the signal during the vehicle passby. The SEL's for locomotives and rail cars are estimated first, and the CNEL is then the average of all daytime, evening and nighttime periods. The following equations define the calculations:

$$\text{SEL (locomotives)} = 140.8 - 10 \log S + 10 \log NL - 15 \log D$$

$$\text{SEL (rail cars)} = 70.8 + 20 \log S + 10 \log NC - 15 \log D$$

$$\text{CNEL} = 10 \log \left[10^{\text{SEL (locomotives)}/10} + 10^{\text{SEL (rail cars)}/10} \right] + 10 \log N (d + 3e + 10n) - 49.4$$

Where SEL = sound exposure level

S = train speed in mph

NL = number of locomotives per train

NC = number of rail cars per train

O = distance to tracks, feet

N = number of trains during 24 hours

d = fraction of N occurring during day

e = fraction of N occurring during evening

b = fraction of N occurring during night

There are no formalized prediction models officially endorsed by any government agency. The model described above was developed over a period of several years as a result of several rail noise studies. As for the roadway equations, these equations utilize a 4.5 dB per doubling of distance drop-off rate, and assume no blocking of the line-of-sight from the observer to the rail line.

Information on rail operations was obtained by the City from the Southern Pacific Transportation Company for the main line through the southern portion of the City and the branch line which extends eastward from the main line. This information included the schedule of daily operations (providing the number of trains and time of occurrence), the typical number of locomotives and rail cars per train, and train speed.

2. Commercial/Industrial Noise

Controlling noise from a commercial or industrial use is best accomplished at the time the facility is being designed. Often, the site layout and building design can be arranged to reduce noise transmission from the commercial or industrial property. Opportunities may also exist when the physical plant is being extensively remodeled or

when the use of an existing facility is being changed. Design considerations include:

- Siting of traffic access points, loading areas, parking lots and solid waste collection areas.
- Enclosing or baffling machinery which must be placed outdoors.
- Using structures as noise barriers.
- Using solid walls around the perimeter of the site.

When applicable, Environmental Impact Reports provide an analysis of noise impacts and discussion of design alternatives or mitigation measures.

As mentioned under the Section entitled Existing Land Use Noise Standards, the City's Zoning Ordinance contains a set of Industrial Performance Standards which impose noise standards, among other standards, on new industrial uses. Expanding these noise standards to all industrial and commercial zoning districts would assist in implementing a uniform noise standard for commercial and industrial development.

Noise from construction sites represents a special type of industrial noise. Because construction noise is temporary, people are usually more tolerant of it than permanent noise-producing installation. While acoustic "curtains" can be used around some stationary equipment, abatement is difficult because most construction activities cannot be enclosed. The most effective long term solution to construction noise is to manufacture construction equipment that produces less noise. The U.S. Environmental Protection Agency is beginning to issue product noise standards which will eventually result in equipment being marketed with lower noise emission characteristics. In the meantime, a reasonable way to limit construction noise

impact is to regulate the time of day when construction activities may occur. Curfews on evening, nighttime, and early morning work, can be imposed through a general noise control ordinance. Such policy should also be applicable to the City and its contractors.

3. Population Noise

Noise from typical residential and recreational activities could be termed "population noise." Sources of population noise include such diverse things as radios, stereos, televisions, musical instruments, tools, power gardening equipment, domestic animals, off-road vehicles, etc. This source of noise is discussed under the Section entitled Ambient Noise Survey.

4. Control of Noise (Mitigation Measures)

A balanced approach to environmental noise control involves both the abatement of noise at its source and the isolation of residential and noise sensitive uses from noise sources. Methods for the control of noise impact at the point of noise reception include:

- Zoning for compatible uses in the vicinity of major permanent noise sources.
- Site planning techniques to shield noise sensitive development.
- Design and construction techniques to insulate individual noise sensitive buildings.
- Redevelopment of noise impacted areas with noise compatible uses.

Major noise sources such as freeways, airports, and railroads are regarded as virtually permanent. While in the long-term, technological advances in noise suppression may significantly reduce the impact of these sources, near- and mid-term results achieved by noise source suppression are expected to be largely offset by increases in traffic volume. To achieve noise compatibility in land use, it is therefore imperative that control be exercised over development of residential and noise sensitive uses in the vicinity of major noise sources. This does not mean that undeveloped land adjacent to a highway or railroad remain vacant or be reserved for industrial, commercial, agricultural, or other uses that are less sensitive to noise. Rather, it implies that these areas should be planned with uses which are noise-compatible. In the case of uses which are not noise-compatible, these may be permitted if measures to reduce on-site noise exposure are incorporated into project designs. Obviously, demand and noise sensitive uses are not sufficient enough to reduce noise exposure to an acceptable level on the project site.

Mandatory acoustical analysis of development plans for all residential and sensitive uses could be a provision of the Zoning Ordinance of the Noise Section of the City's Building Code. An acoustical analysis is now required for all types of projects on a case-by-case basis as part of Environmental Impact Reports whenever the environmental assessment for a project indicates that significant noise impacts may result from a project. The purpose of this analysis is to evaluate noise exposure on the project site and alternatives for on-site mitigation of noise exposure. Depending on the type of development and site specifics, alternatives might consist of:

- Using setbacks and buffer strips.
- Using berms, walls and heavy landscaping as noise barriers.
- Placing height restrictions on dwellings adjacent to noise barriers. The advantage gained by constructing a barrier is lost for the second story of a dwelling which overlooks the barrier.
- Clustering dwellings to take advantage of distance or shielding offered by site topography.
- Orienting buildings so that they act as noise shields for balconies, patios, and yard spaces.

The California Noise Insulation Standards, applicable to all dwellings other than detached single family dwellings, require structures to be designed to reduce exterior noise to an interior level of 45 dB CNEL. As mentioned earlier, the City's Building Code also applies these standards to single family dwellings. The physical techniques of building insulation, depending on the amount of attenuation needed, include, but may not be limited to, the following:

- Increase the mass and stiffness of exterior walls.
- Increase the width of the airspace inside exterior walls.
- Increase the spacing between studs.
- Use staggered studs.
- Add acoustical insulation blankets inside walls.
- Use resilient channels to attach interior wall covering to studs.
- Weatherstrip all doors and windows.
- Reduce window size on doors and windows.
- Use unopenable windows. This may necessitate an alternate source of ventilation.
- Increase glass thickness.
- Install double-glazed windows.
- Use solid core exterior doors.
- Eliminate open beam ceilings.

- Minimize penetrations of exterior walls for ducting and electrical boxes.
- Arrange rooms inside dwellings so that bathrooms, kitchens, hallways, and bedrooms and living rooms are further away.
- Use heavy carpeting and drapes, and acoustical ceiling tiles to reduce reverberations within rooms.

Many of these techniques are the same ones currently being employed in new construction to increase thermal insulation. Thus, noise insulation need add little to the building cost.

Other design techniques to mitigate noise include, but may not be limited to, the following:

- Use "white" noise which is constant background sound for masking noise.

- Use water; the use of fountains for example.

5. Control of Noise (Ordinance)

In 1987 the City adopted a Noise Control Ordinance as a part of the City Ordinance Code. This Ordinance designates four noise zones (I. Noise Sensitive Properties; II. Residential Properties; III. Commercial Properties; and, IV. Industrial Properties) and sets exterior noise level limits for each zone. A description of the background and basis for this Ordinance is contained in section IV.C. of this Appendix.

B. IMPACTS OF NOISE SENSITIVE AREAS

1. Inventory of Noise Sensitive Uses

The following have been identified as sensitive to impacts of excessive noise:

- Parks
- Historical Sites
- Schools
- Hospitals
- Skilled Nursing Homes
- Residential Care Homes
- Mental Hospitals
- Medical Hospitals

Many of these sites are located along major freeways and arterials or near major shopping centers or commercial complexes. These areas are shown as "potential noise sources," in the inventory which follows:

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
PARKS	
Westpark	Highway 33 West main St./So. Ventura Ave. Olive & Mission Street
Eastwood Park	Poli, Main St.
Grant Park	Garden Way/So. Ventura Ave., Pistol Range
Mini-Park	Main Street
Mission Park	Junipero Way/So. Ventura Ave.
Seaside Wilderness Park	Hwy 101
Plaza Park	Thompson/Fir/Chestnut St./Hwy 101
Surfers' Point at Seaside Park	End of Figueroa Street, at beach
(Saticoy) Fritz Huntsinger Sports Complex	Saticoy & Telephone
Promenade Park	End of Figueroa Streets at beach
Saticoy Community Park	Wells Road & Telephone
Ocean Avenue Park	Thompson Blvd./RR
Harry Lyon Park	Ventura Avenue

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
Arroyo Verde Park	Day Road & Foothill
Cemetery Park	Poli Street/Main Street
Hobert Park	Telegraph & Highway 126
San Buenaventura State Beach Park	Pierpont/Hwy 101/San Jon/ Harbor Blvd.
Chumash Park	Petit & Highway 126
Marina Cove	Spinnaker Drive
Marina Park	End of Pierpont & Beach
Seaside Park (Fairgrounds)	Hwy 101/RR/Harbor Blvd./ Figueroa/beach
Channel Islands Visitor Center	Spinnaker Drive/beach
Wildlife Ponds	Spinnaker Drive/City Water & Treatment Plant/beach
Marion Cannon Park	Telephone & Ralston/Hwy 101
Ivy Lawn Cemetery	Victoria Ave. & Hwy 101
Barranca Vista Park	Ralston & Johnson Drive
Junipero Serra Park	No. spur RR/Telephone Rd/.
Camino Real Park	State Hwy 126/Dean Drive
Blanche Reynolds Park	Hwy 101/RR
HISTORICAL SITES	
Ortega Adobe Historical Residence	Main Street/Olive
Ventura County Historical Museum	Main Street
Albinger Archaeological Museum	Main Street
San Buenaventura Mission	Main Street
City Hall	Poli/California Streets
Olivas Adobe Historical Park	Olivas Park Drive
Dudley House	Loma Vista Road

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
SCHOOLS	
High Schools	
Buena High School 5670 Telegraph Road	North Victoria & Telegraph commercial area
Ventura High School 2155 East Main Street	Main Street, commercial area, Poli Street, Seaward Ave.
Mar Vista High School (Continuation School) 501 College Drive	Main Street commercial areas
Middle Schools	
Anacapa Middle School 100 South Mills Road	Mills Road & Buenaventura Shopping Area
Balboa Middle School 247 Hill Road	Telegraph Road & State Hwy 126
Cabrillo Middle School 1426 East Santa Clara St.	Main Street & Thompson Blvd. Commercial areas & So. Pacific RR
De Anza Middle School	No. Ventura Ave., commercial area
Elementary Schools	
Blanche Reynolds School 450 Valmore Avenue	Buenaventura Shopping Center
Elmhurst School 5080 Elmhurst Street	State Highway 126
E. P. Foster School (K-3) 20 Pleasant Place	No. Ventura Avenue area, State Hwy 33
Juanamaria School 100 South Crocker Avenue	Telegraph Road
Junipero Serra School 8880 Halifax	Southern Pacific RR
Loma Vista School 300 Lynn Drive	Hospital Complex near Loma Vista Road and Mills Road

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
Lincoln School 1107 E. Santa Clara Street	Santa Clara Street Main & Thompson, Commercial area
Montalvo School 2050 Grand Avenue	Victoria Ave. at 8th and Hwy 101
Pierpont School (K-3) Martha's Vineyard Court	Pierpont Blvd. and Beach area
Poinsettia School 350 North Victoria Avenue	No. Victoria Avenue area and Foothil Road
Portola School 1350 Partridge Drive	Telephone Road
Saticoy School 760 Jazmin Street	State Hwy 126
Sheridan Way School 573 Sheridan Way	State Hwy 33
Will Rogers School 316 Howard Street	"Five Points" E. Main Street Telegraph Road & Thompson Blvd. & Main Street, commercial areas
Ventura Missionary Church (K-8) 500 High Point Drive	Foothill Road
St. Paul's Episcopal Day School (K-8) 3290 Loma Vista Road	Mills Commercial & Loma vista Road Hospital Complex area
Ventura Montessori School 38 Teloma Drive	Foothill Road, Loma Vista Road
First Baptist Day School 426 S. Mills Road	Mills Road
Friends Pre-school & Elementary 3100 Preble Avenue	No. Main Street, Southern Pacific RR
Holy Cross School 183 E. Main Street	Poli Street/Main Street
Our Lady of the Assumption School 3169 Telegraph Road	Telegraph Road and Buenaventura Shopping Center & Hospital complex
Sacred Heart School of Religion 10770 Henderson Road	Hwy 126 frontage

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
College Heights Christian School 6360 Telephone Road (K-6)	Telephone Road
Temple Christian School (K-12) 5415 Ralston Street	Ralston Street, near Victora Ave.
Wells Road Christian Academy 289 N. Wells Road	Wells Road
Institute of Religion 4747 Loma Vista Road	Loma Vista Road near Mills Road
Grace Lutheran Church Christian Way School 6190 Telephone Road	Telephone Road
Trinity Lutheran Church Pre-School 196 No. Ashwood Avenue	Ashwood Avenue
<u>College & Universities</u>	
Saticoy Christian Academy 901 S. Saticoy Avenue	Saticoy Avenue
Ventura College 4667 Telegraph Road	Loma Vista Road, Telegraph Road and Day Road
Ventura College of Law 4475 Market Street	Main Street Commercial area
Clayton University 260 Maple Court	Buenaventura Shopping Center area at Mills Road
Golden State University 767 N. Ventura Avenue	Ventura Avenue Commercial area
University Center at Ventura Alessandro Drive	Highway 101 and Seaward Avenue
<u>HOSPITALS</u>	
<u>Skilled Nursing Facilities</u>	
The Californian	Loma Vista Road and Ashwood
Ventura Convalescent Hospital 4020 Loma Vista Road	Telegraph Road & Ventura College

IMPACTED NOISE LOCATION	POTENTIAL NOISE SOURCE
Residential Care Facilities	
Doan's Residential Facility 264 Seton Hall Avenue	Loma Vista, Ventura College Complex
The Elms 67 E. Barnett	Ramona Street and No. Ventura Avenue
Jackson Residential Care 1055 Carr Avenue	No. Ventura Avenue
Lincoln Place 63 Lincoln Drive	Main Street, Commercial area
McGee Residential Care Home 313 Banner Avenue	Hwy 126, Telegraph Road
Mound Guest Home 5430 Telegraph Road	Ventura College & Telegraph Road
Pinecrest Clinic of Ventura 1280 S. Victoria Avenue	So. Victoria Avenue Commercial area
Santa Clara Guest Home 1068 E. Santa Clara Avenue	Main Street & Thompson Blvd. Commercial areas
Silver and Gold Guest Home 50 W. Flint Street	Hwy 33. No. Ventura Avenue
Ventura Towne House 4900 Telegraph Road	Telegraph Road Commercial area
Mental Hospitals	
CPC Vista Del Mar Hospital 801 Seneca	North Ventura Avenue area
Ventura County Mental Health 300 Hillmont & Loma Vista	VCMC Hospital complex and Loma Vista Road
Ventura Mental Health Center 3210 Foothill Road	Foothill Road & Hillmont
Hospitals	
Community Memorial Hospital Loma Vista Road & Brent	Hospital Complex, Loma Vista and Main Street commercial area
Ventura County Medical Center 3291 Loma Vista Road	Hospital Complex and Loma Vista Rd. office and commercial area

2. Analysis of Degree of Impacts on Noise Sensitive Areas

An analysis of these sensitive facilities suggests that:

a. Of the parks listed, 16 of the 28 facilities have potential for significant highway/traffic noise.

b. Historical sites - All 7 are located on or near main City thoroughfares.

c. Schools -

Three high schools are also located on or near major arterials, one close to State Highway 126, and three near major commercial areas.

There are 29 elementary and parochial elementary schools. Twenty-one are on or near major arterials or close to a state highway, one is located near Southern Pacific Railroad, 14 are located near major commercial areas.

d. Hospitals are divided into the following categories according, to type of use:

Skilled Nursing - Both of these facilities are located on busy streets;

Residential Care - Nearly all of these facilities are located on busy arterials, and half of them are close to office and commercial areas;

Mental Hospitals - 2 of the 3 mental care facilities are located on arterials;

Medical hospitals - both hospitals are located on a arterial adjacent to commercial and office complexes.

It is suggested that further analysis involve the integration of this noise sensitive data with the ambient noise survey to determine more specifically the noise level for each location.

C. COMMUNITY ATTITUDES TOWARD NOISE

1. General Information About Community Attitudes

a. Noise Complaints

The willingness to express a formal complaint to a public agency about noise is partially dependent upon attitudes and factors other than the actual degree of annoyance. Those who complain about noise tend to be older, more educated, and of a higher socioeconomic status than non-complainants. Complainants represent only a small fraction of those who report or who experience annoyance. This suggests that it could be misleading to use the number of complaints made to a public agency about noise as an indicator of public dissatisfaction. Many people may be highly annoyed and yet never communicate this to a responsible agency.

b. Association Between Noise Exposure and Community Response

The Environmental Protection Agency consolidated data from a number of surveys conducted both in England and the United States, to measure the association between noise exposure and community response. The results of this study are summarized here, showing community

noise exposure (in Ldn) versus the percent of the residential population reporting that they were "highly annoyed" by noise in their neighborhood.

Ldn (dB)	Percent Highly Annoyed
55	17%
50	25%
65	34%
70	43%
75	52%

Not surprisingly, the higher the Ldn, the more people reported a high degree of annoyance in response to noise.

2. <u>Community Attitudes Toward Specific Sources of Noise</u>:

A portion of any community, ranging from 2 to 20 percent of the population, will report a high degree of annoyance to noise at almost any level of intensity. At the other end of the spectrum, about 20% of the population seems almost never bothered by noise, whatever the intensity. Thus, noise control measures would not be likely to affect the reactions of those who might be classed as ultrasensitive or insensitive to noise, but would be of benefit to the remaining two-thirds of the population lying between the two extremes.

The City of Ventura, although bisected by major State Highways, 101 and 126, and host to a Southern Pacific Railroad right of way which extends the length of Ventura's coastline, has little real industrial noise. Most of Ventura's noise is related to highway and freeway traffic. Complaints recorded by the Police Department, the City's

Public Information Office, and the Code Enforcement Section, as well as those coming directly to the City Council, led the City Council in 1986, to adopt a formal City ordinance addressing City noise complaints. At the same time, the Council had commissioned the Comprehensive Plan Review Committee to review all the Elements of the City's Comprehensive Plan, including the Noise Element. As a consequence, both the CNEL Noise Contour study and the Ambient Noise Level Survey described in this Appendix were envisioned as part of the Noise Element, and as background for specific recommendations to deal with noise complaints. Those recommendations are presented, along with the Ambient Noise Survey, in the following section.

Most of the complaints regarding noise which were received by the City during 1986 originated in residential areas, were concentrated during the summer months, and involved loud partiesī stereo systems and the like. In addition, other complaints were received involving noise from pac-mounted blowers operating in commercial areas, in early morning hours, and jacuzzi equipment being operated during the evening.

As this Appendix has indicated, noise is a measurable phenomenon, and to be effective, a noise control ordinance must be able to stipulate what constitutes a violation in some quantifiable manner. In order to do so, the City contracted with Advanced Engineering and Acoustics of Simi Valley for the preparation of an Ambient Noise Survey, which would determine the level of environmental noise throughout the City.

Both the CNEL Noise Contour Map and the ambient noise study have outlined general areas of noisiness which were essential to the City's development of a Noise Control Ordinance.

The CNEL Noise Contour Map has been discussed in an earlier section. Following is a discussion of the ambient noise survey and some recommendations it contains.

3. Ambient Noise Level Survey

An ambient noise level survey was conducted at 29 locations throughout the City from 24 to 27 March 1987. The two purposes of the survey were to document existing community noise levels in order to identify areas of similar noise characteristics, and to gather data with which ambient noise level standards could be developed.

a. Measurement Sites

These 29 measurement sites were chosen using several criteria to accomplish the purposes described above. The first criteria requires the sampling of the various noise exposures experienced throughout the City, i.e., from very quiet to very noisy areas. The second criteria in site consideration requires the selection of sites that have a variety of population densities. The CNEL contour maps and a City street map were reviewed to identify candidate residential locations. The third criteria specifies that selected sites should include locations where noise complaints have occurred. Complaint data provided by the City was used to identify these candidate locations. Site selection must also include a variety of practical locations. Site selection must also include a variety of practical considerations which need to be met, including ease of access, sufficient distance from large reflecting surfaces, absence of non-typical noise sources, etc.

The 29 selected measurement sites are shown in Map 3, and listed in Chart 6. In addition to the location and date and time of measurement, the table lists the land use in the vicinity of each site, and the major noise sources observed during the measurements.

Noise levels were measured at each site during the daytime. Also, at four sites (No. 6, 19, 26 and 29) noise levels were measured during nighttime hours.

b. Measurement Procedures

Noise levels were measured at each location using a GenRad Model 1933 Precision Sound Level Meter, equipped with a one-inch piezoelectric microphone. The sound level meter was mounted on a tripod such that the microphone was four to five feet above ground level, and positioned away from reflecting surfaces. The measurement system was calibrated before and after each measurement using a Gen Rad Model 1562A Sound Level Calibrator.

Using the "fast" meter response, the A-weighted noise level was read at ten-second intervals for a period of 15 minutes. To facilitate the measurement and subsequent analysis of the data, noise level scale was divided into two decibel increments. Each ten-second reading was tallied on the data sheet by placing a check-mark next to the appropriate 2 dB increment within which the reading lies. In this manner at the conclusion of the 15 minute measurement period a histogram of measured noise levels with 90 entries was constructed.

LOCATION OF NOISE MEASUREMENT SITES

CHART 6

IDENTIFICATION OF NOISE MEASUREMENT SITES IN SAN BUENAVENTURA

SITE	LOCATION	DATE	TIME	LAND USE	NOISE SOURCE
1	Telegraph Rd. at Nevada Ave.	Mar. 24	3:45 pm	R,C	T-A, P
2	Saticoy Ave. at Hewitt St.	Mar. 27	6:45 pm	R	T-A, P
3	El Cerrito Circle	Mar. 25	2:28 pm	R	T-L
4	Petit Ave. at Las Cruces St.	Mar. 25	1:00 pm	R,C	T-A, P, AC
5	Havasu St. at Sespe Dr.	Mar. 26	11:58 am	R	T-L, P, AN, AC
6	Via Arroyo at Southview Circle	Mar. 26	6:08 pm	R	T-L, AN
		Mar. 26	1:32 am		
7	Via Pasito	Mar. 26	5:37 pm	R	T-L, AN,
8	Chipmunk Circle	Mar. 26	12:51 pm	R	T-L, AN, AC
9	Robin Ave. at Swallow St.	Mar. 26	1:33 pm	R	T-L
10	Whipporwill St.	Mar. 26	3:26 pm	R	T-L, T-F, P, AN
11	Hastings Ave. at Hunter St.	Mar. 26	4:49 pm	R	T-L, T-A
12	Aurora Dr. at Bryn Mawr St.	Mar. 27	9:43 am	R	T-L, AC
13	Carlsbad Pl.	Mar. 26	4:00 pm	R	T-L, T-A
14	Rockford Court	Mar. 27	9:11 am	R	T-L, AN
15	Redwood Ave. at Marshall St.	Mar. 27	10:20 am	R	T-L, T-F, AN
16	Arundell Ave.	Mar. 25	6:45 pm	R,C	T-F
17	Porter Ln. at Empire Ave.	Mar. 27	6:07 pm	R	T-L, P
18	Agnus Dr.	Mar. 27	10:49 am	R	T-L, T-A, P
19	Brent St. at Preble Ave.	Mar. 25	5:35 pm	R	T-L, TR
		Mar. 26	2:18 pm		T-F
20	Howard Dr. at Channel Dr.	Mar. 25	6:10 pm	R,C,I	T-L
21	Santa Catalina St.	Mar. 27	12:18 pm	R	T-L, T-A, TR
22	Nathan Lane	Mar. 27	1:38 pm	R	AC, S
23	Woodstock Lane	Mar. 27	2:10 pm	R	AN, S
24	Manzanita Ave.	Mar. 27	5:36 pm	R	T-L, AN, AC
25	S. Hemlock St. at Thompson Blvd.	Mar. 27	11:32 am	R,I	T-L, T-A
26	Main St. at N. Ventura Ave.	Mar. 27	2:52 pm	R,C	T-A
		Mar. 26	12:28 am		T-A
27	W. Prospect St. at N. Olive St.	Mar. 27	4:49 pm	R	T-L, T-A, P, AN
28	Piaute Ln. at Shawnee Ln.	Mar. 27	4:12 pm	R	T-L, P
29	Encino Ln. at Fraser	Mar. 27	3:26 pm	R,I	T-L, C
		Mar. 25	11:25 pm		T-L, T-F, I

NOTES: Land Uses: Residential (R), Commercial (C), Industrial (I)
Noise Sources: Traffic-Local (T-L), Traffic-Arterial (T-A), Traffic-Freeway (T-F), People (P)
Animals (AN), Aircraft (AC), Train (TR), Surf (S), Industry (I), Construction (C)

LM/lm/202G

c. Measurement Results

From the histogram at each site, several statistical descriptors of the measured noise exposure were determined. First, the maximum noise level, Lm, which was the highest (A-weighted) noise level occurring during the measurement period was determined. Three percentile levels, the L10, L50, and L90 levels, were also determined. These represent the levels exceeded 10%, 50% and 90% of the time, respectively. Finally, the average sound level, Lav, was calculated using a logarithmic average of the individual measured levels.

Chart 7 lists these noise levels for each site (the N appended to a site number indicates a nighttime measurement). The levels were plotted by site in Chart 8. On the figure, the Lm data points have been connected, as have the L50 and L90 data points, to aid in interpreting the measurements.

Several trends can be seen from the plotted data. First, the maximum levels do not vary much from site to site, with a few exceptions, as when a single car passes by a normally quiet site creating a high maximum noise level. Second, for those sites where nighttime levels were measured in addition to daytime levels, nighttime levels were always lower (sometimes significantly lower), as might be expected. Finally, the range of noise levels at a particular location can often be correlated with the noise sources at that location. For example, at Site 16 the noise environment is dominated by traffic on the Ventura Freeway, which is relatively constant; the spread in

CHART 7

MEASURED NOISE LEVELS IN SAN BUENAVENTURA

A-WEIGHTED NOISE LEVEL in dB

SITE	Lm	LIO	L50	L90	Lav
1	79	68	61	50	66.1
2	73	66	56	47	62.2
3	67	56	49	43	52.9
4	76	71	64	54	66.6
5	60	55	50	43	51.3
6	64	52	41	38	49.5
6N	49	39	35	33	40.5
7	63	52	47	44	51.4
8	67	57	50	45	53.8
9	73	70	52	47	63.7
10	68	63	57	54	59.1
11	78	65	58	52	63.7
12	73	66	58	51	61.5
13	69	65	59	53	61.1
14	57	49	45	43	47.1
15	76	60	53	50	62.1
16	71	68	65	63	65.5
17	75	62	54	51	61.2
18	78	68	51	47	64.6
19	75	62	57	51	60.7
19N	53	49	47	44	47.1
20	79	65	57	53	63.2
21	75	67	51	47	61.7
22	60	57	54	52	54.8
23	67	53	50	47	52.1
24	51	43	39	36	40.8
25	80	74	61	54	68.5
26	87	80	72	66	76.1
26N	85	67	51	45	69.2
27	77	72	63	53	67.6
28	67	50	43	41	51.1
29	67	58	51	47	54.8
29N	50	48	44	41	45.1

levels from Lm to L90 of 8 dB is relatively small compared to the other sites. The same 8 dB spread occurs at Site 22, where the noise environment is dominated by surf sounds. In contrast there is a 24 dB spread between Lm and L90 at Site 27, where the noise environment includes traffic on local and arterial streets, children playing, dogs barking, etc.

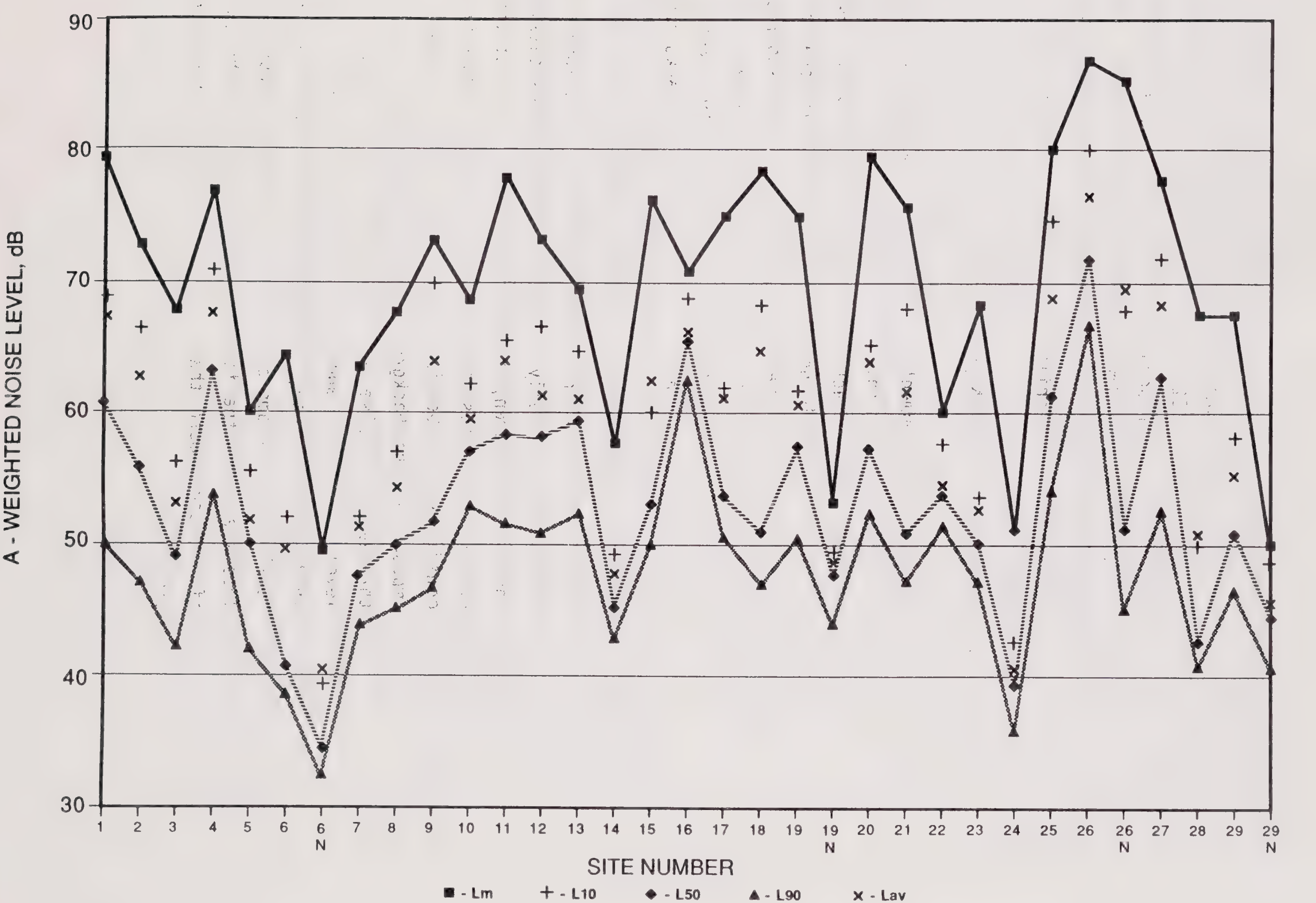
d. Sites With Similar Noise Characteristics

The noise environment at a typical community location can be divided into two components. The first component is the background noise, which usually comes from unidentifiable noise sources at unknown locations away from the site. For most urban and suburban areas, the background noise is generally the result of traffic on distant streets. The L90 noise level is considered to be a good measure of this background noise.

The second component is the noise that occurs locally, and which can usually be identified. Vehicles passing the site, children, animals and construction activity are all examples of this local noise, sometimes considered to be intruding noise, which is superimposed on the background. This local noise causes the maximum noise at the site. Depending on the level, frequency, and duration of this noise, it can influence the Lav, the L10 and sometimes the L50 levels. For example, if the local noise occurs for less than half the time, it does not affect the L50; if it occurs more than half the time, it affects the L50.

Chart 8

MEASURED NOISE LEVELS
CITY OF SAN BUENAVENTURA



As an illustration, at Site 16 the noise of freeway traffic is the local noise, and it affects all the noise levels. At the other extreme, there were no identifiable noises at Site 6 during the nighttime measurement; everything measured was "background." At Site 6 during the day, however, cars passing by the Site caused the maximum level, and affected the Lav and L10 levels. The L50 and L90 levels at the site were controlled by the background.

Based on these concepts, Chart 8 was analyzed in order to segregate the measurement sites into groups having similar noise characteristics. If the L50 and L90 levels are considered, it can be seen that there are two sites (16 and 26) which clearly have higher background levels than all the other sites. It can also be seen that three sites (6, 24 and 28) have clearly lower background levels (during the day) than all the other sites. The remaining sites, with background levels between the two extremes, can be divided into two categories by considering whether or not they are affected by traffic on a major nearby street. This leads to the following four categories:

Category	Description
A	Quiet noise environment
B	Moderate noise environment, affected by traffic on local streets only
C	Moderate noise environment, affected by traffic on major streets or freeways
D	Noisy noise environment

The sites which lie in each category are listed below, along with the range of L50 and L90 levels among the sites.

Category	Sites	L50 Range	L90 Range
A	6, 24, 28	39-43 dBA	36-41 dBA
B	3, 6, 7, 8, 9, 12, 14, 17, 18, 19, 20, 22, 23, 29	45-58	43-53
C	1, 2, 4, 10, 11, 13, 15 21, 25, 27	51-64	47-54
D	16, 26	65-72	63-66

Within each category, the noise characteristics of the sites are similar, at least in terms of the magnitude of the background noise levels. Some differences in the local noise sources affecting each site is certainly to be expected; probably the most obvious example of this is Category D where one of the sites is near a freeway and the other is in a downtown, urbanized environment.

As a final point, it is interesting to examine the difference in levels between daytime and nighttime samples, by category. The four sites at which night levels were measured lie in three of the four categories:

Category	Sites	Day - Night L50	Day - Night L90
A	6	6 dB	5 dB
B	19	10	7
C	29	7	6
D	26	21	21

As the activities which generate noise diminish at night, the noise levels decrease. In general, the sites with progressively higher daytime levels are influenced by more of these activities, thus their noise levels decrease the most.

4. Ambient Noise Level Standards and the Development of a Comprehensive Noise Control Ordinance

Ambient noise level standards are an essential component in the development of an effective ordinance to deal with complaints relating to noise. Ambient standards are the baseline for enforcement activities, as they determine the level of noise which constitutes an offense in terms of the City Noise Control Ordinance.

a. Ambient Noise Level Standards

In setting ambient noise level standards, which are exterior noise level limits that are not to be exceeded by intruding noises, several factors must be considered:

- In areas that are already relatively noisy, an intruding noise should not exceed the measured ambient so that the total noise exposure does not increase significantly.

- In areas that are relatively quiet, it may not be technically feasible or economically practical to limit an intruding noise to the measured ambient.

- In areas of moderate noise, small increases in noise exposure are not discernable, and may therefore be permitted without serious impact. (Note that some municipal ordinances limit intruding noise to the measured ambient plus 5 dB.)

Thus the selection of appropriate ambient standards involves many tradeoffs.

b. In most noise control ordinances, the noise level limits apply to intruding noises which occur for some stated portion of an hour; if the intruding noises occur for lesser portions of the hour, the noise level limits may be relaxed somewhat. For example, in both the L.A. County and Orange County ordinances, and the California Office of Noise Control Model Ordinance, the exterior noise level limit applies to intruding noises which last for 30 minutes or more per hour. If the noises occur for between 15 and 30 minutes, the exterior limit is raised by 5 dB. An additional 5 dB is added to the exterior limit for noises which last only 5 to 15 minutes, etc. In these ordinances, then, the resulting limits which apply for different durations can be thought of as percentile levels; the basic exterior limit is really an L50 limit, the 5 dB higher limit is an L25 limit, etc. This approach is

common in municipal ordinances, and is included in the City's Noise Control Ordinance.

Since the exterior noise level limit may represent an L50 level, the L50 levels measured throughout the City have been used to derive ambient noise level standards. Review of the L50 data, coupled with consideration of the factors discussed above, lead to the following recommended ambient standards:

a. For all residential areas during daytime hours (7 a.m. to 10 p.m.), the exterior L50 shall not exceed 50 dBA.

b. For all residential areas during nighttime hours (10 a.m. to 7 a.m.), the exterior L50 shall not exceed 45 dBA.

c. For all residential areas and times of day, if the measured ambient L50 exceeds the standards listed above, the exterior L50 shall not exceed the measured ambient L50.

Among the 29 measurement sites, three (which were grouped in Category A) had measured L50 levels of less than 45 dBA, three (which were grouped in Category B) had L50 levels of 45 to 50 dBA, and the remainder had L50 levels of 50 dBA and above. These recommended standards would therefore result in limiting intruding noises to within 5 dB of the measured ambient or to the measured ambient for all Category B, C and D sites.

LIST OF REFERENCES

1. Noise Element of the Comprehensive Plan of the City of Poway, September 20, 1983.

2. Noise Element of the General Plan (1980-2000) of the City of Redding, June 17, 1985.

3. Noise Element of the Comprehensive Plan of the County of Santa Barbara, February 11, 1986.

4. Technical Appendix for the Noise Element, General Plan (1980 - 2000), City of Redding, June 17, 1985.

5. Building Code, City of Ventura.

6. Ordinance Code (including Zoning Ordinance), City of Ventura

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